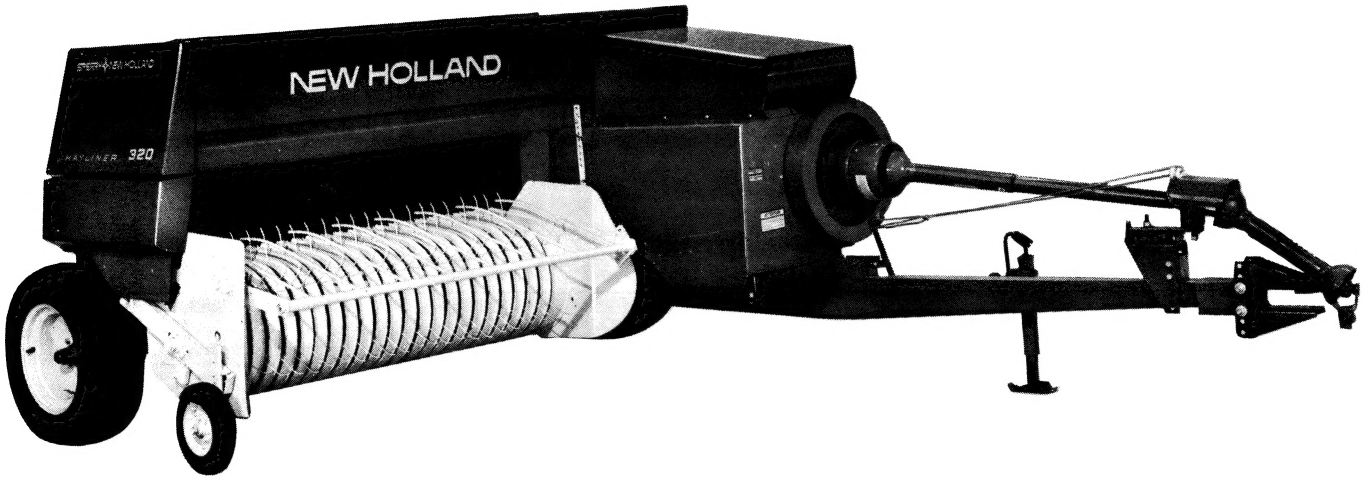
OPERATOR'S MANUAL

HAYLINER®
320

NEW HOLLAND



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Reprint

A NOTE TO YOU, MR. OWNER:

In buying a Sperry New Holland Hayliner, you have chosen wisely. Into it have gone years of thought, research, and improvement both at the factory and under actual field conditions. Thousands of users all over the world are pleased with the results obtained with their Sperry New Holland equipment. We are confident that with proper adjustment and reasonable care, your machine will give you the superior economical performance for which it was designed.

This manual contains information concerning the adjustment, operation, and maintenance of your baler. Please read it carefully in order to become familiar with your machine and its adjustments.

KEEP THIS BOOK AVAILABLE FOR READY REFERENCE

Your Sperry New Holland dealer is interested in your obtaining the most from your investment. He will be glad to answer any questions that you may have about your baler and his staff of factory trained mechanics is always ready to serve you.

Rely on your authorized Sperry New Holland dealer to supply you with the highest quality baler twine and genuine Sperry New Holland service parts.

ABOUT IMPROVEMENTS

Sperry New Holland is continually striving to improve its products. We must, therefore, reserve the right to make improvements or changes when it becomes practical and possible to do so, without incurring any obligation to make changes or additions to the equipment sold previously.

WARRANTY
NEW HOLLAND FARM EQUIPMENT

New Holland Inc., hereafter called the "Company", warrants, in accordance with the provisions below, to each user/purchaser of New Holland new equipment from an authorized New Holland dealer, that such equipment is free from defects in material and workmanship (except engines, tires, tubes, and batteries) and will be warranted for a period of 24 months from date of sale or lease to the first user/purchaser, if used and serviced in accordance with the recommendations in the Operator's Manual.

The obligation of the Company under this warranty is limited to repairing, or at its option, replacing any part(s) which, in the Company's judgment, is defective.

Except as set forth above, **THE COMPANY SHALL HAVE NO OBLIGATION OR LIABILITY OF ANY KIND ON ACCOUNT OF ANY OF ITS EQUIPMENT, AND SHALL NOT BE LIABLE FOR SPECIAL OR CONSEQUENTIAL DAMAGES. THE COMPANY MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND SPECIFICALLY, THE COMPANY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS. SOME STATES DO NOT PERMIT LIMITATIONS OR EXCLUSIONS OF IMPLIED WARRANTY OR INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE LIMITATIONS OR EXCLUSIONS IN THIS WARRANTY MAY NOT APPLY.**

The specific details of the Owner's Warranty, outlined in more detail in "Warranty Detail" on the reverse side of this certificate, are expressive of the quality built into your equipment. Since it produced the world's first automatic field pick-up baler in 1940, New Holland has had as its goal the manufacture of top quality equipment. Today, New Holland products are the result of years of experience in modern farm mechanization.

When you invested in this New Holland equipment, you became eligible for the protection of the Company's Warranty.

WARRANTY DETAIL

The following information explains the details of the New Holland farm equipment warranty. These details include an explanation of the criteria for determining warranty, those items which are covered by warranty, those which are not covered, and information on how to obtain warranty service.

Warranty Determination

Only defective parts are covered by this warranty. Any part or parts of a New Holland product found to be defective within 24 months from date of sale or lease to the first user/purchaser, in accordance with the provisions of this warranty, will be repaired or replaced by an authorized New Holland dealer.

Items Covered by Warranty

New Holland's warranty includes the replacement or repair of any part or parts of machines or attachments on New Holland new equipment purchased from an authorized New Holland dealer (except engines, batteries, tires and tubes) which are defective in material, workmanship, or both. Engines, batteries, tires, and tubes will be warranted as defined by their manufacturer.

Genuine New Holland replacement parts will be warranted for 90 days from date of purchase, or the remainder of the original equipment warranty period, whichever is longer.

Obtaining Warranty Service

To obtain warranty service, contact the authorized New Holland dealer from whom the machine was purchased. If this is not practical, any authorized New Holland dealer may perform warranty work.

Engine warranty service shall be handled by the manufacturer's local authorized dealer. When the New Holland dealer is not the authorized engine dealer, he will make arrangements with the manufacturer's authorized dealer to have the required warranty work done.

Items Not Covered

1. Dealer Travel Time - The customer shall be responsible for payment of dealer travel time to the machine or to deliver the machine to the dealer's service shop for repair. New Holland warranty does not cover travel time.
2. Used Equipment - New Holland warranty shall apply only to the original owner of new equipment sold by an authorized New Holland dealer. With the exception of the special Bonded Protection for metal manure spreader sides, the Company shall have no liability for used equipment. Used equipment is sold "AS IS".
3. Engines - Engine warranty shall be handled by the manufacturer's local authorized engine dealer. When the New Holland dealer is not the authorized engine dealer, he will make arrangements with the manufacturer's authorized dealer to have the required warranty work done.
4. Tires, Tubes, Batteries - Tires, tubes and batteries shall be warranted by the selling dealer or by local representatives of the manufacturer.
5. Modified or Altered Equipment - No warranty shall apply on any equipment or parts that have been modified, or altered in any way without prior approval and knowledge of the Company. Nor is there warranty if service, other than normal replacement of service items, is performed by someone other than an authorized dealer.
6. Normal Wear or Maintenance Parts - New Holland shall not be responsible for normal replacement parts such as cutting knives, chains, belts, filters, oil, nor for parts which are worn out unless they are determined to be defective in material or workmanship.
7. Miscellaneous - No warranty shall apply to damage resulting from accident, misapplication, abuse, or damage caused by environment (such as exposure to corrosive material).

Leased, Rented, or Special Purchase Plan

If a unit is leased, rented, or used by a customer on a Special Purchase Plan, the warranty period starts on the date the unit is first leased and or rented. If the unit is sold prior to the expiration of the warranty, the warranty will continue in effect for the remainder of the warranty period.

About Improvements

New Holland is continually striving to improve its products, and therefore reserves the right to make improvements or change when it becomes practical and possible to do so, without incurring any obligations to make changes or additions to the equipment sold previously.

OWNER ASSISTANCE

We at New Holland and your New Holland dealer want you to be completely satisfied with your investment. Normally any problems with your equipment will be handled by your dealer's Service Department. Sometimes, however, misunderstanding can occur. If your problem has not been handled to your satisfaction we suggest the following:

1. Contact the owner or General Manager of the dealership, explain the problem, and request assistance. When additional assistance is needed your dealer has direct access to our branch office.
2. If you cannot obtain satisfaction by doing this, contact the New Holland branch office in your area and provide them with:
    - Your name, address, and telephone number
    - Machine model and serial number
    - Dealership name and address
    - Machine purchase date and amount of use
    - Nature of problem

Columbus
PO Box 28207
Lincoln Village Br.
Columbus, OH 43228
(614) 276-7161

Dallas
PO Box 5488
Arlington, TX 76011
(817) 649-1555

Denver
PO Box 39124
Montbello Station
Denver, CO 80239
(303) 373-1010

Fresno
PO Box 7796
Fresno, CA 93727
(209) 291-6661

Kansas City
15300 W. 109th St.
Lenexa, KS 66219
(913) 888-7000

Memphis
PO Box 18519
Memphis, TN 38118
(901) 362-1161

Minneapolis
PO Box 1540
Twin City Airport,
MN, 55111
(612) 454-6300

New Holland
500 Diller Avenue
New Holland, PA 17557
(717) 354-1112

Calgary
Box 1616, Main P.O.
Calgary, AB
CANADA T2P 2M7
(403) 273-6771

Toronto
PO Box 7000
Brampton, ON
CANADA L6V 2M9
(416) 457-2720

3. If you need further assistance contact:

Consumer Services Department
Mail Station 500
New Holland Inc.
New Holland, PA 17557
(717) 354-1545

When contacting New Holland's branch office or Consumer Services Department, be aware that your problem will likely be resolved in the dealership using the dealer's facilities, equipment and personnel. So it is important that your initial contact be with the dealer.

PLEASE READ CAREFULLY!

INCLUDED THROUGHOUT THIS MANUAL AND ON MACHINE DECALS YOU WILL FIND PRECAUTIONARY STATEMENTS SUCH AS "CAUTION", "WARNING" AND "DANGER", FOLLOWED BY SPECIFIC INSTRUCTIONS.

THESE PRECAUTIONS ARE INTENDED FOR THE PERSONAL SAFETY OF YOU AND THOSE WORKING WITH YOU. PLEASE TAKE THE TIME TO READ THEM.

PERSONAL SAFETY!

CAUTION: THE WORD "CAUTION" IS USED WHERE A SAFE BEHAVIORAL PRACTICE ACCORDING TO OPERATING AND MAINTENANCE INSTRUCTIONS AND COMMON SAFETY PRACTICES WILL PROTECT THE OPERATOR AND OTHERS FROM ACCIDENT INVOLVEMENT.

WARNING: THE WORD "WARNING" DENOTES A POTENTIAL OR HIDDEN HAZARD WHICH HAS A POTENTIAL FOR SERIOUS INJURY. IT IS USED TO WARN OPERATORS AND OTHERS TO EXERCISE EVERY APPROPRIATE MEANS TO AVOID A SURPRISE INVOLVEMENT WITH MACHINERY.

DANGER: THE WORD "DANGER" DENOTES A FORBIDDEN PRACTICE IN CONNECTION WITH A SERIOUS HAZARD.

ADDITIONAL PRECAUTIONARY STATEMENTS SUCH AS "ATTENTION" AND "IMPORTANT" ARE FOLLOWED BY SPECIFIC INSTRUCTIONS. THESE STATEMENTS ARE INTENDED FOR MACHINE SAFETY.

MACHINE SAFETY!

ATTENTION: THE WORD "ATTENTION" IS USED TO WARN THE OPERATOR OF POTENTIAL MACHINE DAMAGE IF A CERTAIN PROCEDURE IS NOT FOLLOWED.

IMPORTANT: THE WORD "IMPORTANT" IS USED TO INFORM THE READER OF SOMETHING HE NEEDS TO KNOW TO PREVENT MINOR MACHINE DAMAGE IF A CERTAIN PROCEDURE IS NOT FOLLOWED.

IMPORTANT!

FAILURE TO FOLLOW THE "CAUTION", "WARNING", AND "DANGER" INSTRUCTIONS MAY POSSIBLY RESULT IN SERIOUS BODILY INJURY.

CONTENTS

MR. OWNER:

IF THE SERIAL NUMBER IS #571010 OR BELOW, PLEASE USE THE "PLUNGER BEARING AND KNIFE ADJUSTMENTS" ON PAGES 31-32-33 AND 34.

IF THE SERIAL NUMBER IS #571011 OR ABOVE, USE PAGES 35-36-37-38-39-40-41 AND 42.

THESE UNIVERSAL DECALS ARE IN VARIOUS PLACES ON YOUR BALER

SYMBOLS as used on decals	 SEE OPERATOR'S MANUAL	 POWER TAKE-OFF	 GEAR BOX
 NEGATIVE	 ROTATIONAL SPEED	 NUT TIGHTENING	 CAUTION/WARNING/DANGER
 HYPOID GEAR	 OIL	 GREASE	h *HOURS* min *MINUTES* s *SECONDS* TIME INTERVALS

CAUTION: THIS SYMBOL IS USED THROUGHOUT THIS BOOK WHENEVER YOUR OWN PERSONAL SAFETY IS INVOLVED. TAKE TIME TO BE CAREFUL!

CAUTION!

MOST FARM IMPLEMENT ACCIDENTS CAN BE AVOIDED BY THE OBSERVANCE OF A FEW SAFETY PRECAUTIONS.

1. **DON'T CLEAN, LUBRICATE, OR MAKE ANY ADJUSTMENTS ON THE BALER WHILE IT IS IN MOTION.**
2. **DON'T ENGAGE THE CLUTCH UNTIL YOU KNOW THAT EVERYONE IS CLEAR OF THE MACHINE AND HAVE MADE SURE THAT NO TOOLS ARE LYING ON THE MACHINE.**
3. **DON'T WORK AROUND THE MACHINERY IN LOOSE CLOTHING THAT MIGHT CATCH IN ANY OF THE MOVING PARTS.**
4. **DON'T ATTEMPT TO PULL LOOSE HAY FROM ANY PART OF THE BALER WHILE IT IS IN OPERATION.**

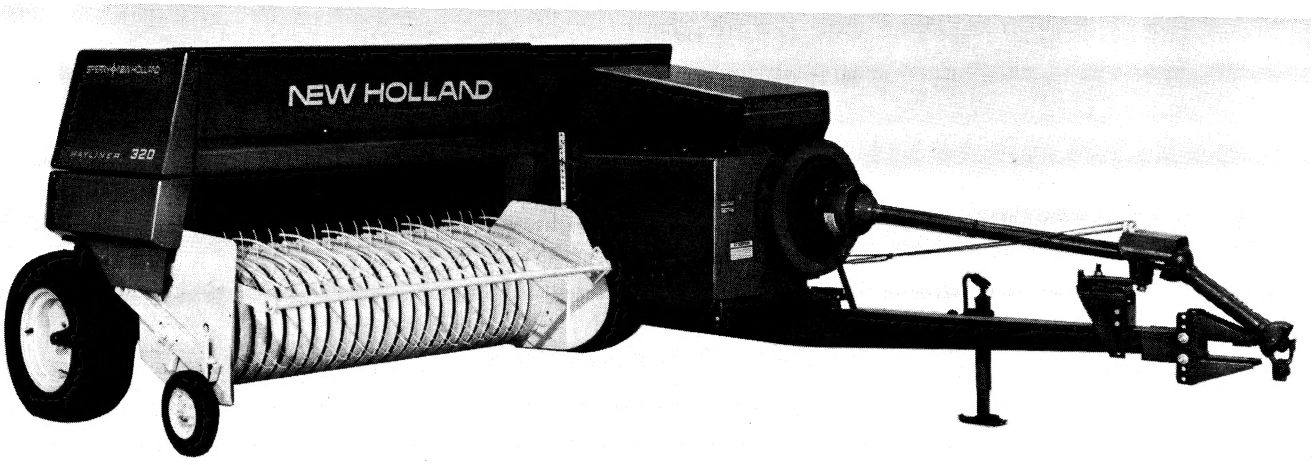


FIGURE 1

BEFORE USING YOUR BALER

1. Read the operating instructions carefully.
2. Check all bolts and nuts to be sure they are tight.
3. Check all belts and chains to be sure they are properly aligned and adjusted.
4. Check tire pressures.
5. Lubricate the baler carefully. In general, lubrication every 1,000 bales should be sufficient.

OPERATION

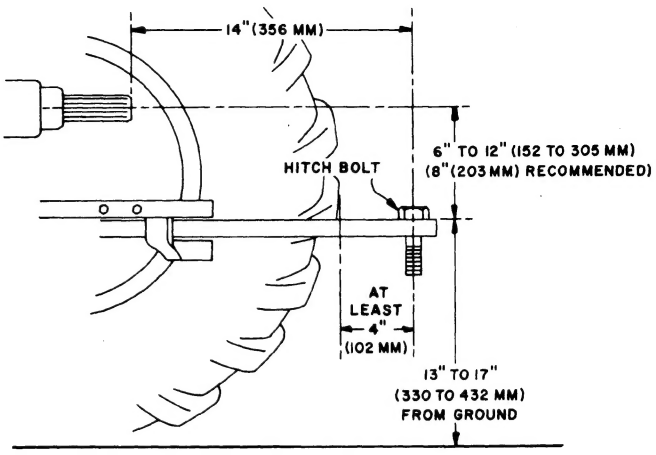


FIGURE 2

ATTACHING THE PTO BALER TO THE TRACTOR

The Hayliner 320 PTO baler is designed for use with an ASAE standard tractor hitch. It is very important that the hitch point be located exactly as specified because an improperly located hitch point will subject the universal joints of the PTO drive to undue stresses which may result in damage to these parts.

NOTE: Never attach this baler to a 1000 RPM PTO.

When attaching the baler to a tractor, these steps should be followed.

1. Adjust the length of the tractor draw bar so the horizontal distance between the end of the tractor PTO spline and the hitch pin is 14" (360 mm), as shown in Figure 3, and at least 4" (102 mm) past the outside radius of the tractor tire. ASAE further specifies that the distance from the center of the PTO spline to the top of the draw bar should be 6"-12" (152-305 mm) — 8" (203 mm) is recommended. The top of the rear end of the draw bar should be 13"-17" (330-432 mm) from the ground. On some tractors, a hitch adapter plate must be used to obtain the correct distance while on others, which are not ASAE standard, it may be necessary to install a PTO conversion kit.

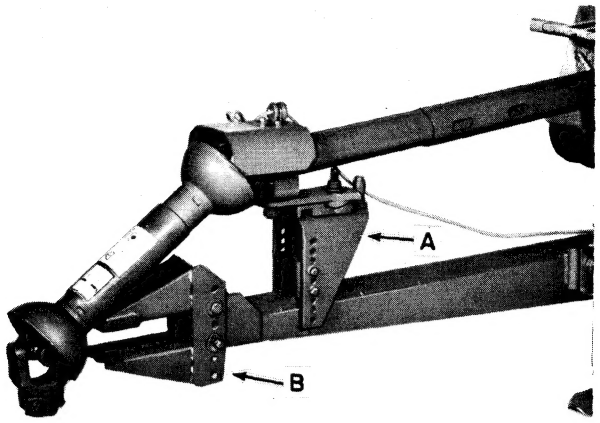


FIGURE 3

2. Use stop bolts to secure the draw bar in a stationary position directly under the tractor PTO spline. NEVER ALLOW THE DRAW BAR TO SWING FROM SIDE TO SIDE and be sure that it is pinned so THE HITCH POINT IS DIRECTLY BENEATH THE PTO SPLINE CENTER LINE. If the tractor wheel runs on the windrow, move the tractor wheel in to secure windrow clearance.
3. Attach the baler tongue to the tractor draw bar with a 1" (25 mm) diameter hitch pin. INSTALL A JAM NUT OR A COTTER PIN TO PREVENT THE HITCH PIN FROM BEING LOST.
4. Adjust the baler hitch, B, Figure 3, up or down as required so the bale chamber is level. Torque the hitch bolts to 170 ft. lbs. (320 N·m) torque.
5. Swing the jack up. Pull the tongue latch rope, which actuates the tongue latch. Carefully drive forward until the tongue swings into baling position.
6. Attach the front yoke of the PTO shaft to the tractor spline. On any tractor having a spline other than the standard 1⅜" (35 mm), it is necessary to use a spline adapter.
7. Adjust the PTO support, A, Figure 3, up or down so front section of PTO drive line is level. Move bolt, D, Figure 4, as required after adjusting PTO support.

   Avoid extremely short turns when the baler is operating. Stop the PTO when turning sharply to reduce wear on the universal joints.

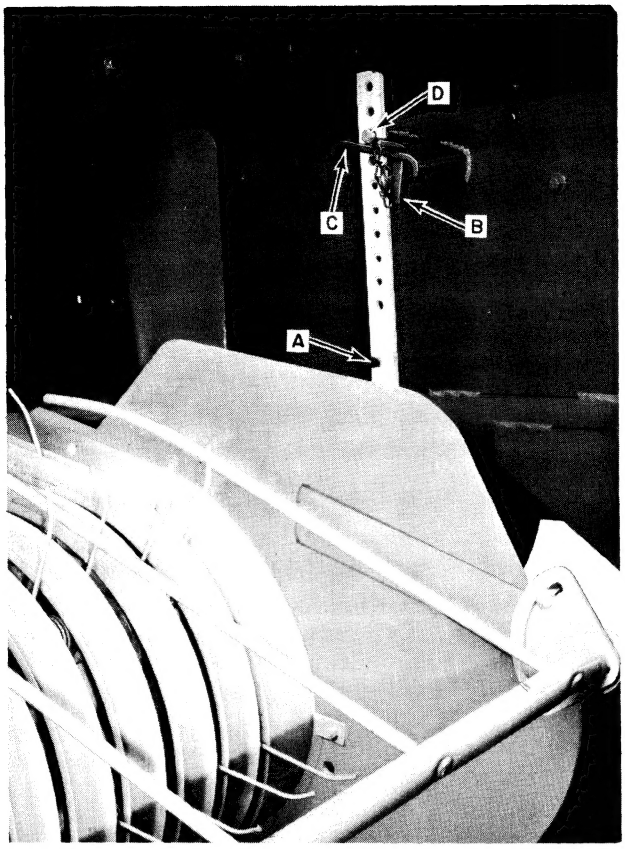


FIGURE 4

TRANSPORTING THE BALER

Pull the tongue latch pin rope, which actuates the tongue latch and carefully back up until the tongue swings into transport position. *IMPORTANT: Never operate the baler PTO with the tongue in transport position.*

Raise the pick-up until the notch, A, Figure 4, in the lift strap can be engaged on bracket, C. Insert the safety pin, B, in the slot in front of the lift strap to prevent the strap from being disengaged during transport.

Bolt, D, Figure 4, limits the downward travel of the pick-up while baling.

TOWING THE BALER ON PUBLIC HIGHWAYS

Sperry New Holland equipment complies with the ASAE standard recommendations for safety when transporting slow moving vehicles on public highways. The baler is equipped as follows:

1. Reflective tape is provided in the two locations indicated in Figure 5.
2. A socket located on the baler frame facilitates the installation of the SMV (slow moving vehicle) emblem as shown in Figure 5.

Because of the variation in safety laws of different states, modifications may be necessary. Your authorized Sperry New Holland dealer will assist you in making any changes necessary to comply with the laws of your state.

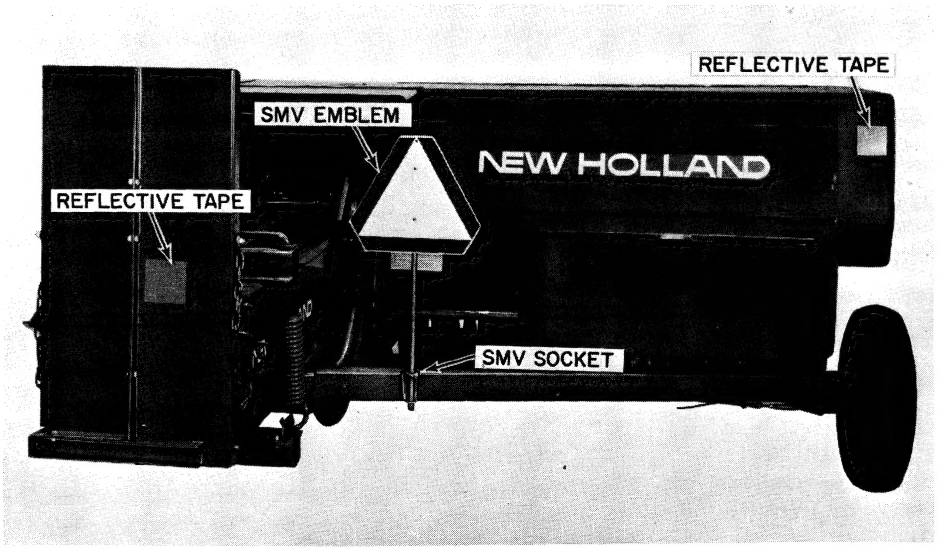


FIGURE 5

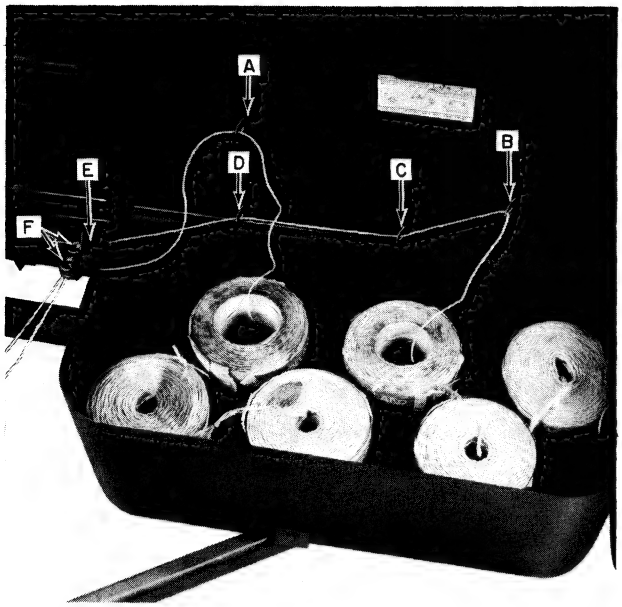


FIGURE 6

THREADING THE BALER - TWINE MODELS

Place six balls of twine in the twine box. Tie the left balls and the right balls together as shown in Figure 6.

Thread twine from the left center ball through A, Figure 6, and from the right center ball through B, C and D, in the twine box lid. The twines then go through the tension clip, E, and twine guides, F, shown in Figure 6. From there through twine guide, G, Figure 7, on the needle yoke, and through guides, A and B, then through the eye of the needles. Tie the end to the bale chamber brace as shown in Figure 7.

At this point, it is advisable to feed material into the baler until the bale chamber is full and the metering wheel trips the knotters.

When the knotters rotate, the needles will deliver the twine into the knotters and automatically thread them.

Remove the section of twine that was tied to the brace and proceed to bale.

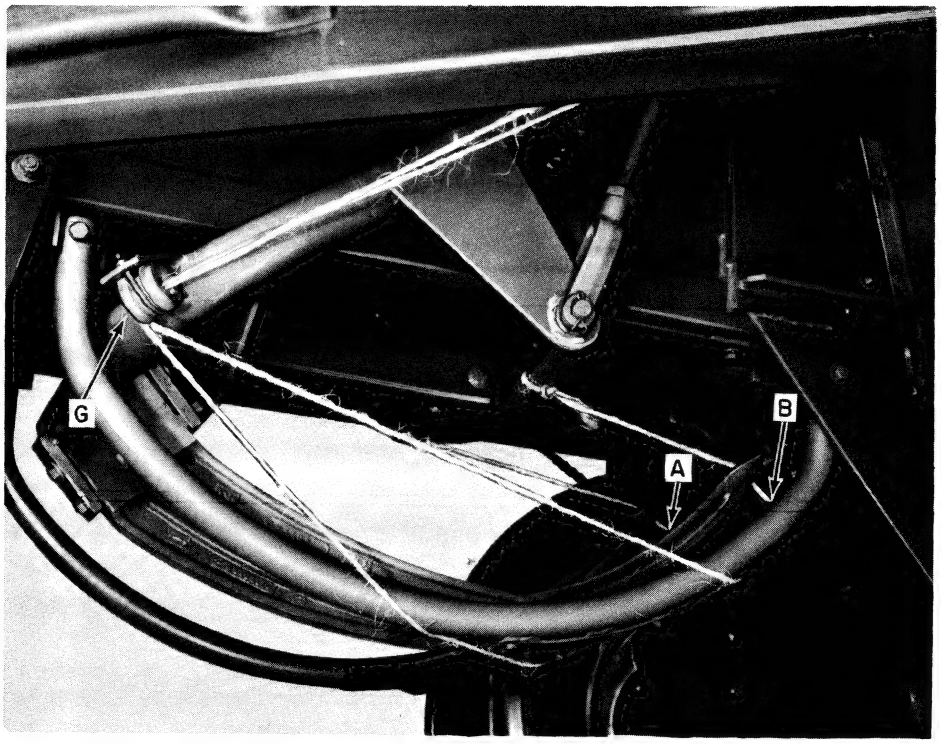


FIGURE 7

FIGURE 8

THREADING THE BALER - WIRE MODELS

The wire carrier, shown in Figure 8, is designed to carry six coils of 14½" gauge wire packaged in cardboard self-dispensing cartons.

Wire is to be placed in the carrier as shown in Figure 9.

FIGURE 9

Remove the knock-out sections from the cartons. Locate the trailing and leading ends of each coil Wire is drawn from the center of each coil, therefore, the leading end will come from the center and is marked "Start this end" on a tag. The trailing end of each coil is marked "Finish" on a tag and comes from the outermost portion of the coil and down between the coil and the carton side to the center knock-out portion. The wire cartons must be placed in the carrier so the side of the carton which has the trailing edge of the wire between it and the coil is facing TOWARD THE REAR OF THE BALER.

Place coils, 1 and 2, in the carrier as shown in Figure 9, with the trailing ends toward the rear as described above. Stand the coils, 3, 4, 5 and 6, on the ground directly behind the carrier with the trailing ends toward the rear.

Splice the trailing end of coil, 1, to the starting end of coil, 3, and the trailing end of coil, 2, to the starting end of coil, 4. See "Wire Splicer" for directions for making a splice. Lift coils, 3 and 4, into their respective places in the wire carrier as shown in Figure 9. Repeat for coils, 5 and 6.

The starting end of the wire from the right front coil (coil 2, Figure 9) goes through opening, D, and through the guide at A, Figure 8. From opening, A, it goes by guide, A, Figure 10, through guide, F, around idler, B, and through the left-hand wire guide and roller assembly, C, Figure 10, as shown. Be sure the wire passes between the roller and spacer in guide, C, Figure 10. The wire is then tied to the reinforcing band directly behind the left-hand needle.

The starting end of the wire from the left front coil (coil, 1, Figure 9), goes through opening, C, and through the guide at B, Figure 8. From opening, B, it goes through guide, A, Figure 10, around idler, E, and through the right-hand wire guide and roller assembly as shown at F, Figure 10. Be sure the wire passes between the roller and spacer in guide, F, Figure 10. The wire is then tied to the reinforcing band directly behind the right-hand needle.

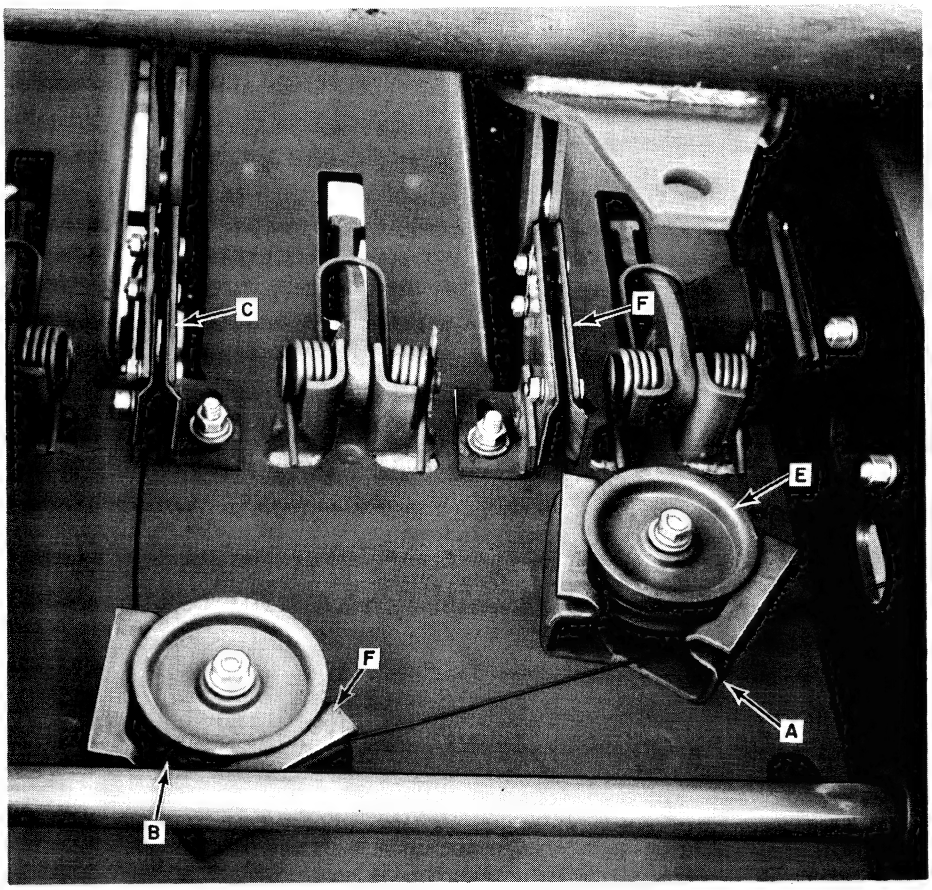


FIGURE 10

IT IS IMPORTANT THAT THE WIRES ARE NOT TWISTED OR CROSSED AT ANY POINT.

At this point, it is advisable to feed material into the baler until the bale chamber is full and the metering wheel trips the twister.

When the twister starts, the needles will deliver the wires to the twister and automatically thread it.

Remove the loose ends of wire from the reinforcing band and proceed to bale.

WIRE SPLICER

This splicer will enable you to splice two coils of wire together. The new coil can be spliced to the end of the original coil. This will save costly down time and the baler will not need to be rethreaded as the splice will feed through the wire guides and rollers.

To splice the two wires proceed as follows:

1. Remove the twist lever from the clip, see Figure 11.

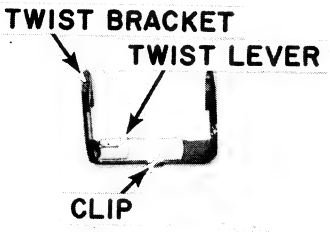


FIGURE 11

2. Lay the two wires in the twist bracket as shown in Figure 12. Let the ends of both wires protrude about ½" (13 mm) beyond the bracket as shown in Figure 12.

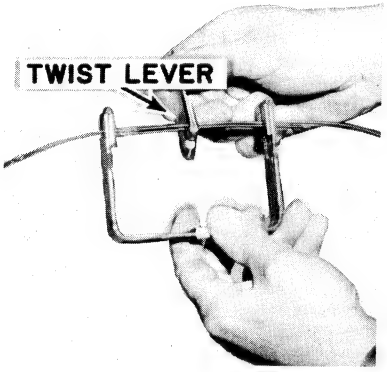


FIGURE 12

3. Install the twist lever over the two wires as shown in Figure 12, and then turn the lever four complete turns, as shown in Figure 13, to complete the twist.

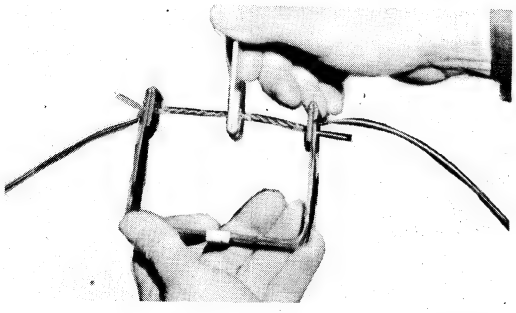


FIGURE 13

4. Remove the twist from the twist bracket and cut the tail on the leading end of the twist as close as possible as shown in Figure 14. This will enable the twist to pass freely through the wire guides and rollers.

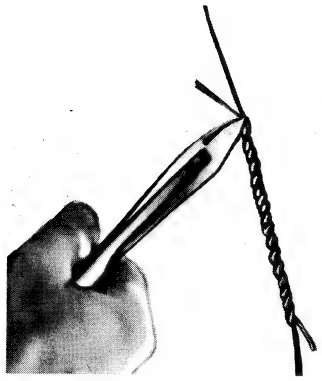


FIGURE 14

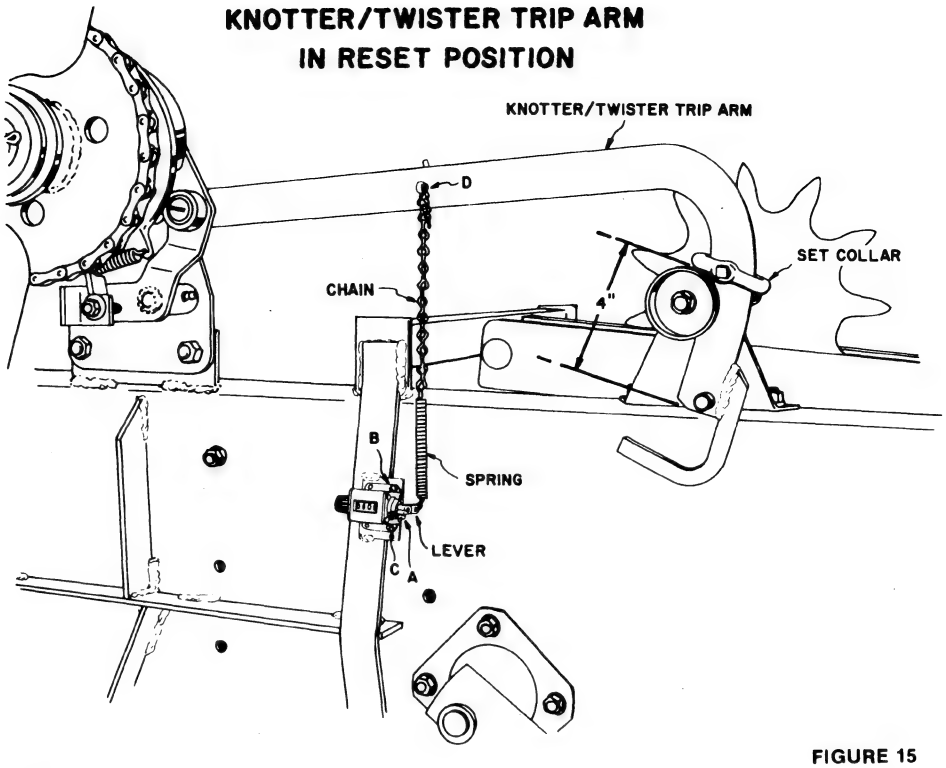


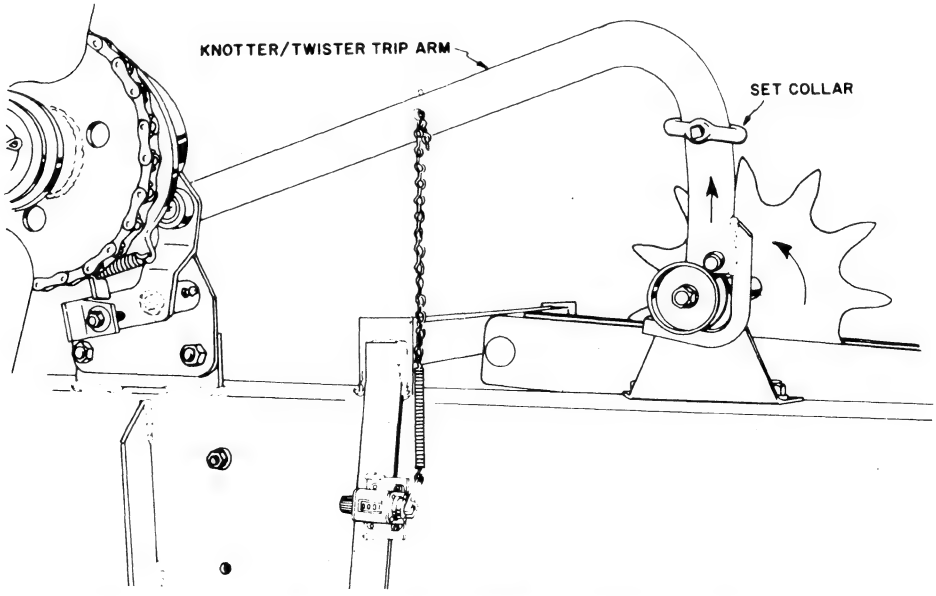
FIGURE 15

BALE COUNTER

The bale counter lever is actuated by the chain and spring which is attached to the knotter/twister trip arm as shown in Figure 15. The length of the chain must be adjusted so there is a slight amount of slack when the knotter/twister trip arm is in the reset position, Figure 15. This will assure that the counter lever is fully released. Finer adjustment may be obtained by loosening screw, A, Figure 15, and repositioning the counter lever on the counter shaft.

Figure 16 shows the knotter/twister trip arm in the tripped position. *IMPORTANT: Each time the bale length is changed by moving the bale length set collar, the length of the counter trip chain must be checked and adjusted.*

To reset the counter, place the knotter/twister trip arm in the home position; then turn the reset knob until all four zeros appear on the window. Then reverse the reset knob until a distinct release is felt. All four tumblers are then aligned.



KNOTTER/TWISTER TRIP ARM IN TRIPPED POSITION

FIGURE 16

WINDROW PREPARATION

A properly prepared windrow is essential to high capacity baling and the production of well shaped bales of uniform length. The windrow should be of medium size and as uniform as possible. It should not be too large for the baler to pick up and handle efficiently.

ALWAYS MOW, RAKE AND BALE IN THE SAME DIRECTION.

STARTING THE BALER

After the baler is serviced and correctly attached to the tractor, make sure that all persons and tools are clear of the machine and cautiously engage the tractor PTO. Operate the baler slowly for a time without load and gradually increase the plunger speed to a maximum of 105 strokes per minute.

IMPORTANT: The baler is designed to operate at a maximum speed of 105 plunger strokes per minute. The throttle range of tractors having excess PTO speed should be limited to prevent possible damage to the machine.

For best results, operate the baler so the plunger speed is no more than 105 strokes per minute. Regulate the tractor ground speed to suit the windrow size. Do not attempt to overfeed the baler as it will result in poorly shaped and ragged looking bales. As a guide, do not attempt to put any less than twelve strokes per 36" (90 cm) bale. See section on "Pick-up Slip Clutch".

The knotters and twisters are adjusted at the factory and should need little or no further adjustment. If the baler should mistie a few bales when first starting to bale do not tamper with it before a brief "break-in" period.

Experience has shown that a large percentage of tying difficulties is the result of baling with excessive bale tension. THEREFORE, BEFORE MAKING ANY ADJUSTMENTS BE CERTAIN THAT EXCESSIVE BALE TENSION IS NOT THE CAUSE OF THE DIFFICULTY.

Do not attempt to regulate the size or density of the bales with the tension on the twine or wire.

Should it become apparent that tying difficulty is not due to excessive tension, paint or rough edges, but rather to maladjustment, study the section on knotter or twister adjustment carefully before attempting to correct the difficulty.

UNPLUGGING THE BALER

If windrows are too large, or bunchy, or if the ground speed is too fast the baler may become plugged and break a flywheel shear bolt. Should this occur, the following steps should be taken to unplug the baler.

1. Disengage the tractor PTO clutch and back the baler away from the windrow. Shut off tractor engine. On engine models, disengage drive belts and stop engine completely.
2. Wait until the flywheel stops. Replace the flywheel shear bolt.
3. Make certain the knotters and needles are in the home position. If they are not, remove the needles from the bale case by pulling rearward on the needle yoke. Reset the trip arm and knotter clutch pawl.
4. Release all bale tension on the bale tension cranks.
5. Start the tractor engine and run at approximately 1/3 speed.
6. Slowly engage the tractor PTO clutch and attempt to turn the baler flywheel until the baler PTO clutch begins to slip. Disengage the tractor PTO clutch which will allow the baler flywheel to turn backward. Repeat this procedure until the baler clears itself. On engine models follow same procedure — engaging and disengaging drive belts to clear the baler.
7. Disengage tractor PTO clutch and shut off tractor engine.
8. Reset bale tension and resume baling operation.

PICK-UP

Lower the pick-up for field operation. Always raise the pick-up and latch it securely when transporting the baler from field to field or on highways. Adjust pick-up wheel if necessary, to obtain approximately 2 inches (51 mm) clearance between the tips of the teeth and the ground.

LUBRICATION

DO NOT ATTEMPT TO LUBRICATE THE BALER WHILE IT IS RUNNING OR WHILE TRACTOR IS RUNNING!!

The Sperry New Holland Model 320 Hayliner is designed to require a minimum of lubrication.

However, regular lubrication is the best insurance against delays and repairs, and greatly increases the life of the machine.

Under normal conditions, the baler should be lubricated after every 1,000 bales of operation.

The following is a list of the points that require lubrication, with a reference number that identifies each location on the corresponding pictures.

All points except those with special notations should be lubricated until grease is forced out around the bearings and then excess grease should be wiped off.

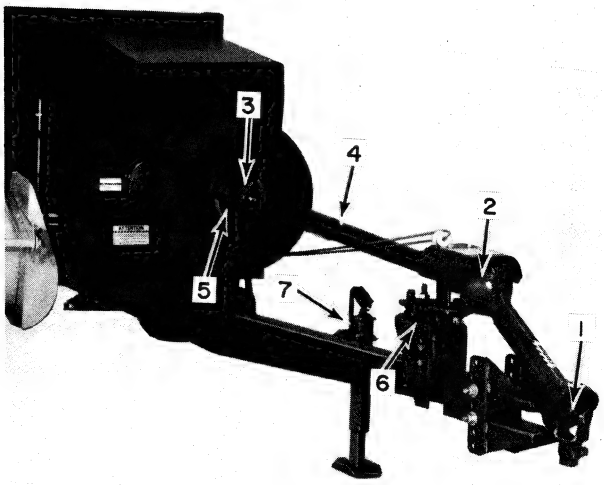


FIGURE 17

PTO MODELS ONLY

1, 2 and 3— Figure 17. Front and rear universal joints. Lubricate the universal joints of the PTO drive carefully with one or two pumps of a hand gun twice a week.

4—Figure 17. Telescoping PTO shaft.

NOTE: Excessive lubrication may damage the grease seals.

5—Figure 17. Overrunning clutch bushing. Grease sparingly every 10,000 bales.

6—Figure 17. Power pivot, push pivot aside and apply grease every 10,000 bales.

7—Figure 17. Jack.

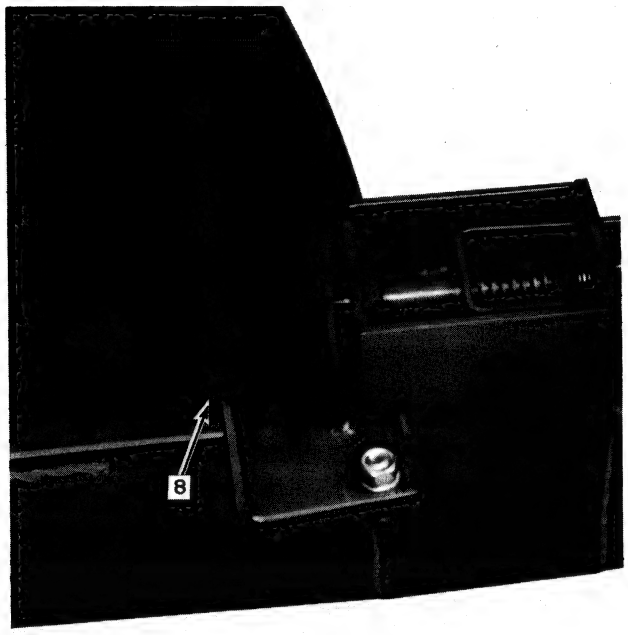


FIGURE 18

ENGINE AND PTO MODELS

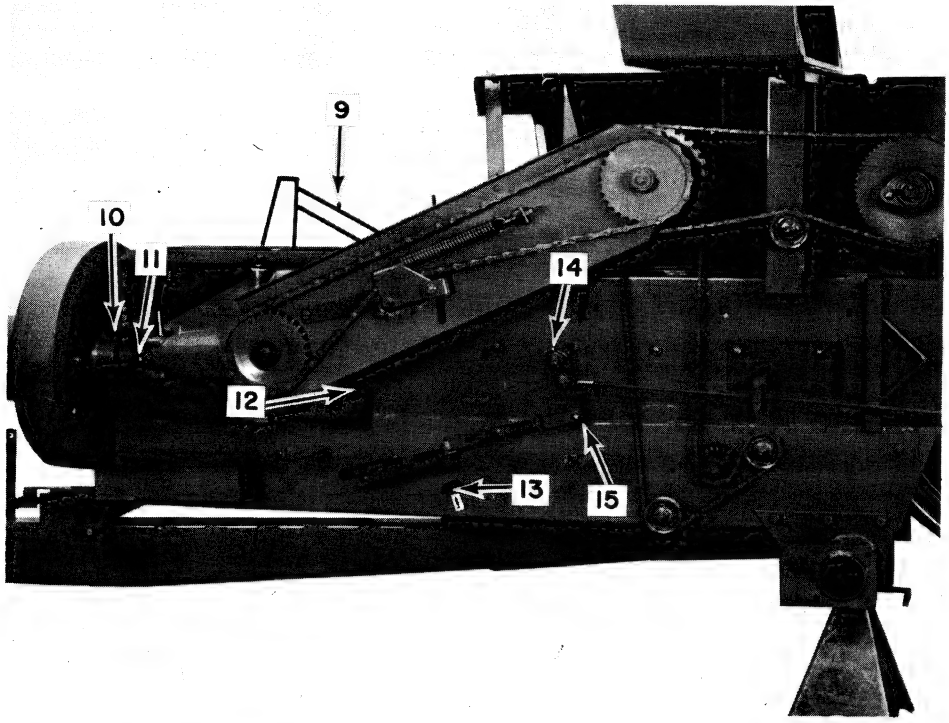
8—Figure 18. Tongue roller.

9—Figure 19. Plunger pin bearings.

10—Figure 19. Flywheel.

11—Figure 19. Flywheel shaft. Do not force, grease only until slight pressure can be detected.

12—Figure 18. Gearbox. Check oil level every 5,000 bales. Fill to level plug with a good grade of hypoid lubricant, SAE 90.



SHIELDS SHOWN REMOVED FOR CLARITY.

FIGURE 19

13—Figure 19. Needle latch.

14—Figure 19. Needle latch link.

15—Figure 19. Needle latch linkage. Oil as required.

16—Figure 20. Pick-up drive overrunning clutch pins, (2 places).

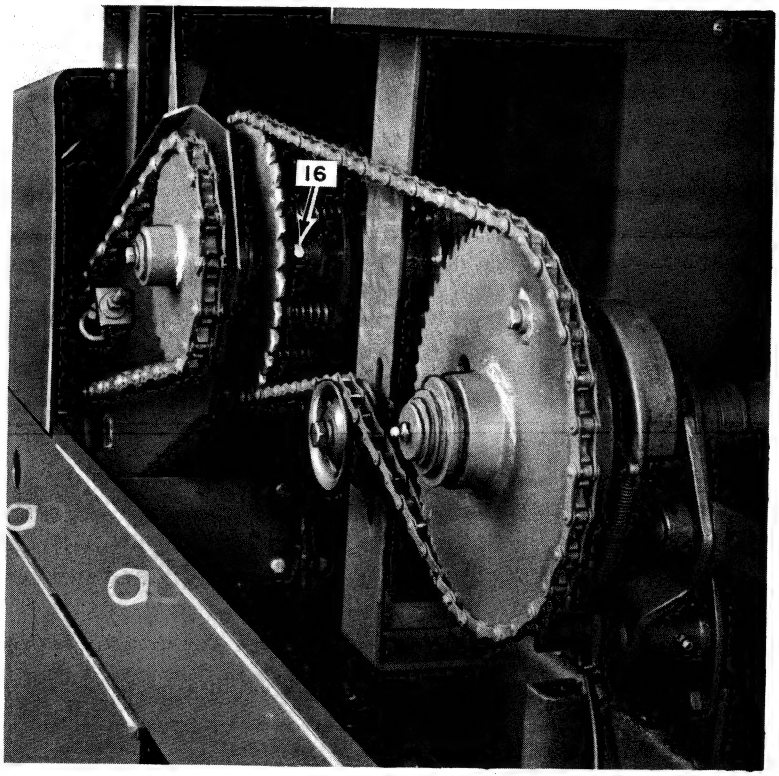


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FIGURE 20

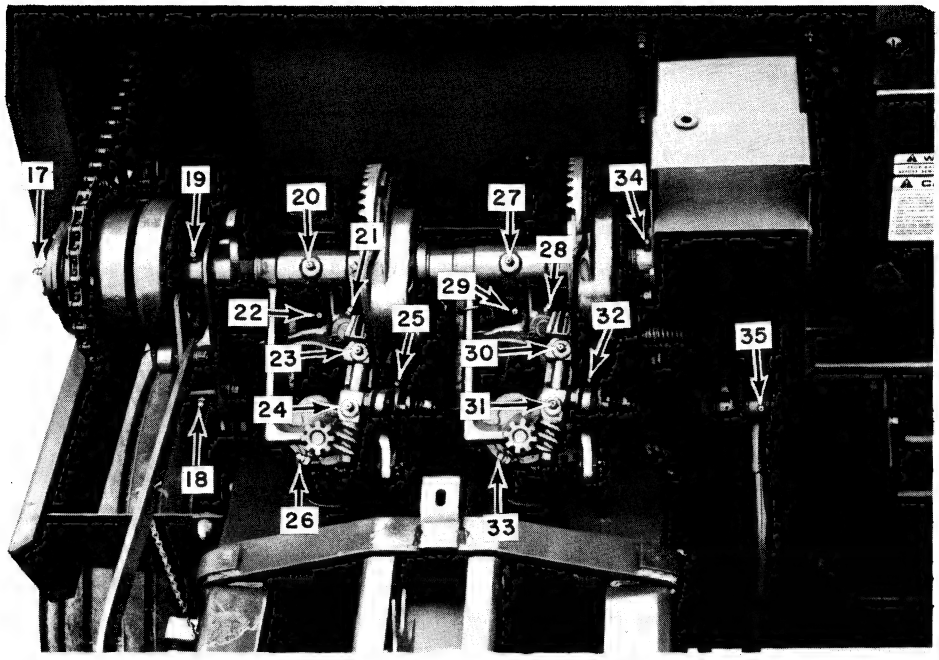

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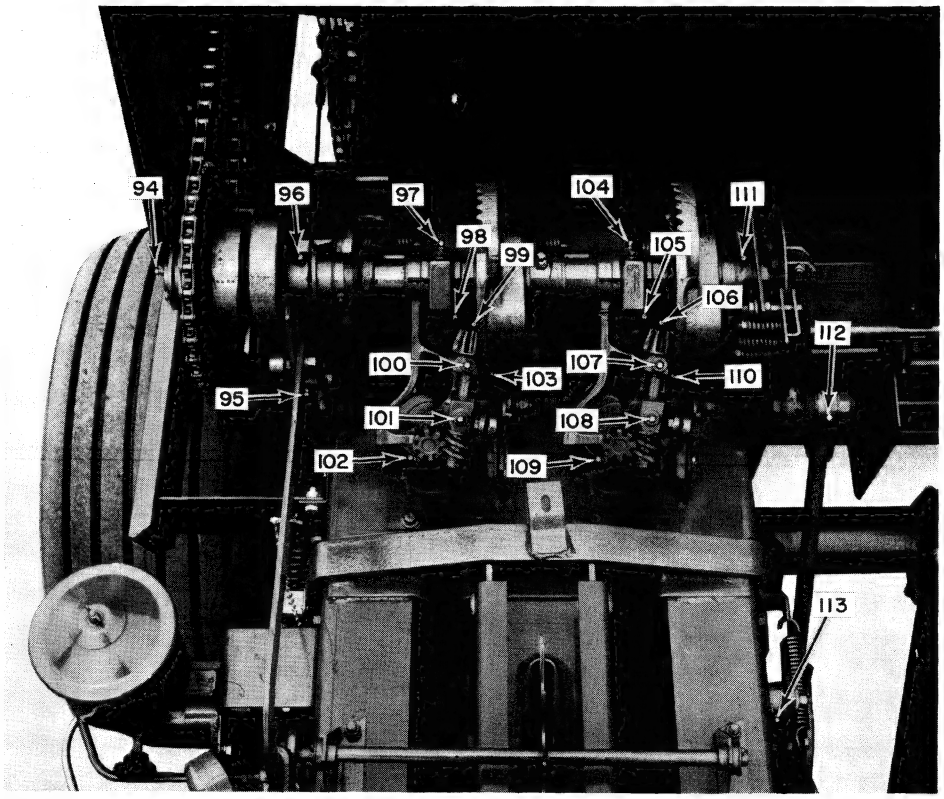
FIGURE 21

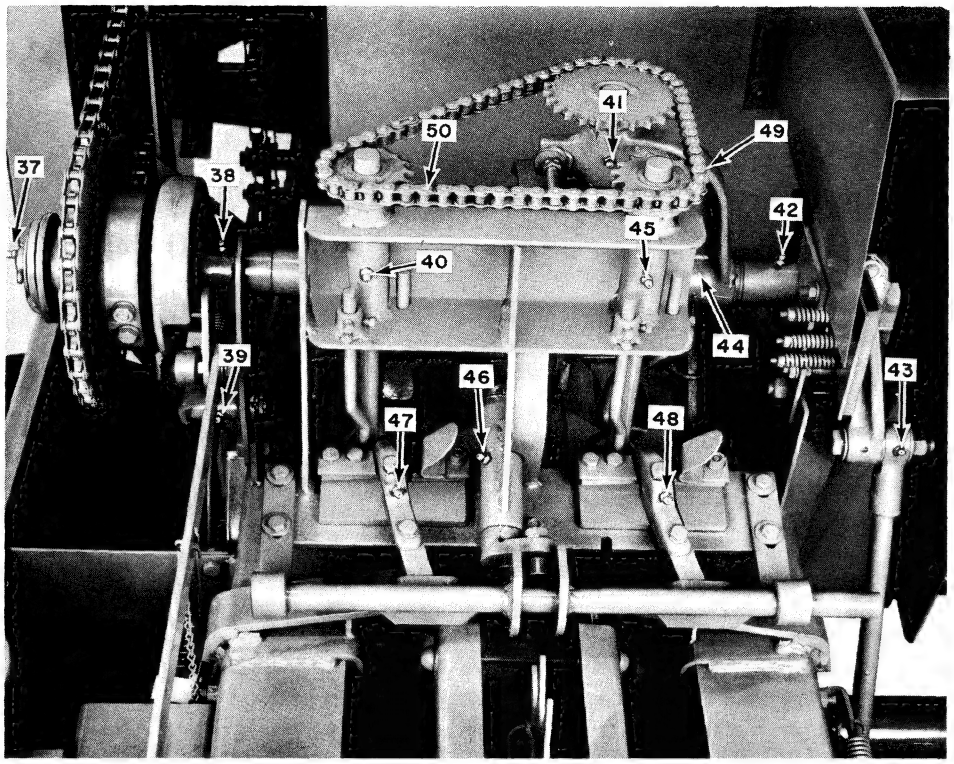
17 to 35—Figure 21. Standard knotter. Twine tie balers.

94 to 113—Figure 22. Heavy duty knotter. Twine tie balers.



SHIELDS SHOWN OPEN FOR CLARITY.

FIGURE 22



SHIELDS SHOWN OPEN FOR CLARITY. **FIGURE 23**

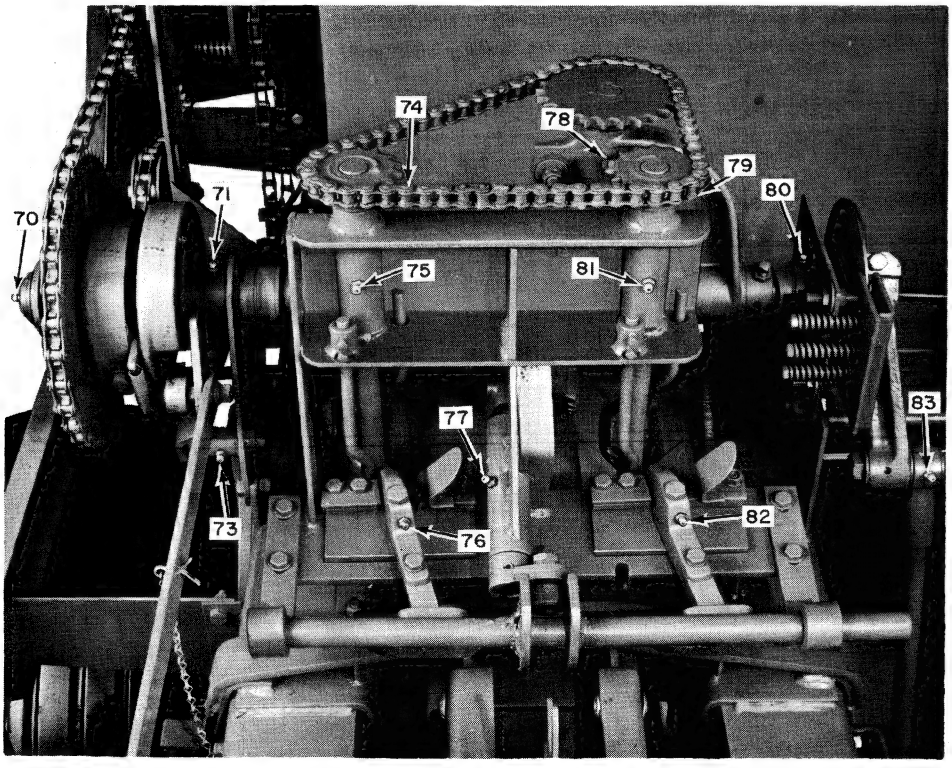
37 to 50—Figure 23. Standard twister. Wire tie balers.

70 to 83—Figure 24. Heavy duty twister.

84—Figure 24. Right needle yoke pivot. Also left needle yoke pivot on opposite side of baler.

85—Figure 24. Needle yoke rod pivot pin.

86—Figure 24. Detent lever.



SHIELDS SHOWN OPEN FOR CLARITY. **FIGURE 24**

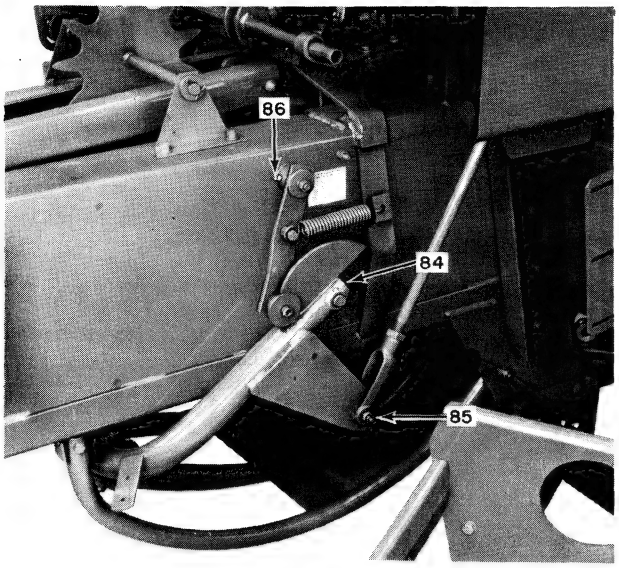
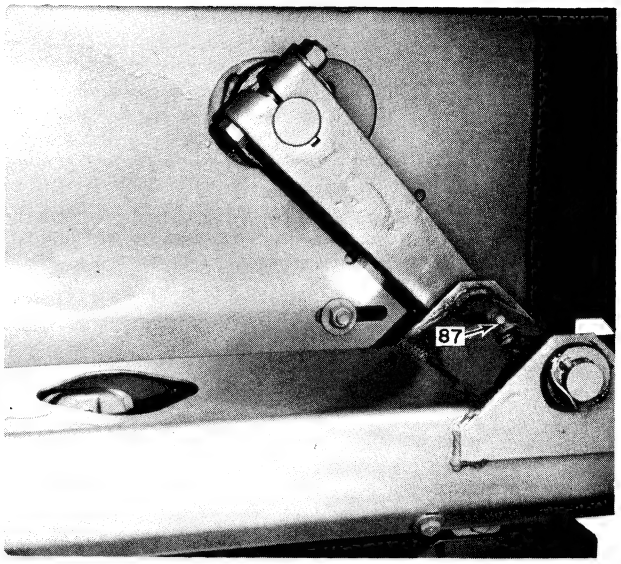


FIGURE 25



SHIELDS SHOWN OPEN FOR CLARITY.

FIGURE 26

87—Figure 25. Crank arm.

87A—Figure 27. Tine bar.

88—Figure 28. Right and left ground wheels clean and repack wheel bearing with a good grade wheel bearing lubricant once each season.

89—Figure 28. Pick-up guide wheel.

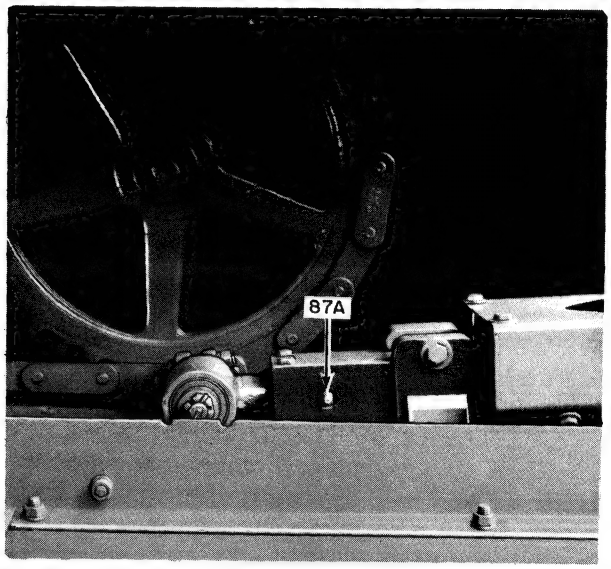


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FIGURE 27

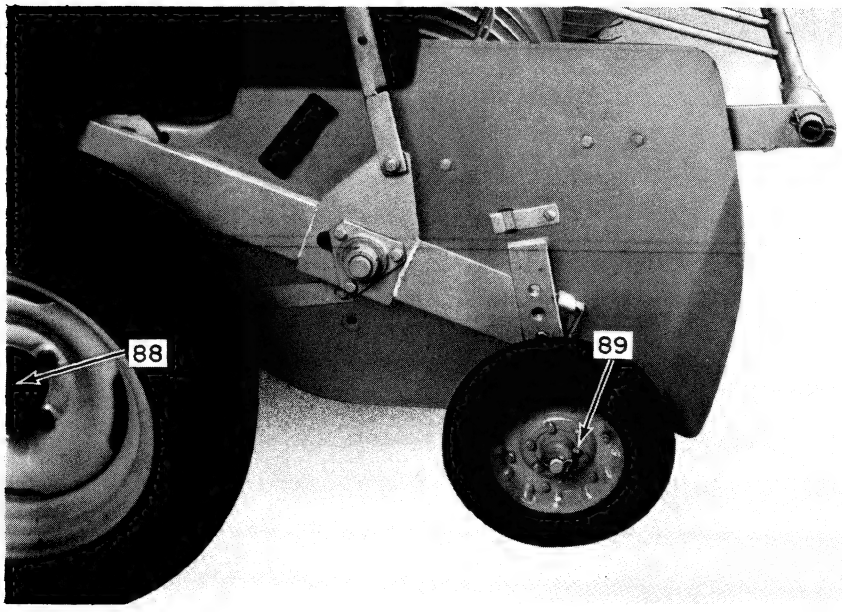
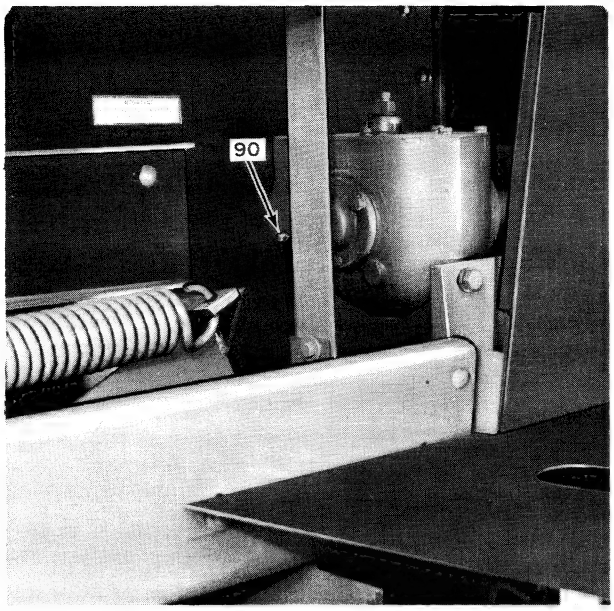


FIGURE 28



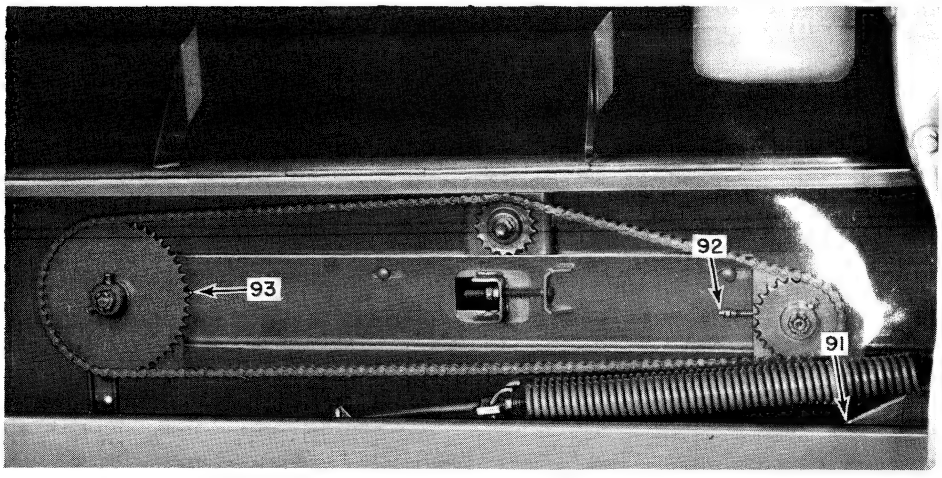
SHIELDS SHOWN OPEN FOR CLARITY. **FIGURE 29**

90—Figure 29. Feeder drive gearbox. Check oil every 5,000 bales. Fill to level plug with a good grade of hypoid lubricant, SAE 90.

91 to 93—Figure 30. Feeder drive and pick-up lift spring pivot.

NOTE: Keep the knotter/twister brake disc and brake linings free of grease and oil at all times.

Oil roller chains daily with light oil or a 50% oil and kerosene mixture. In extremely abrasive conditions, it may be advisable to run the roller chains without oil.



SHIELDS SHOWN OPEN FOR CLARITY. **FIGURE 30**

BALER ADJUSTMENTS

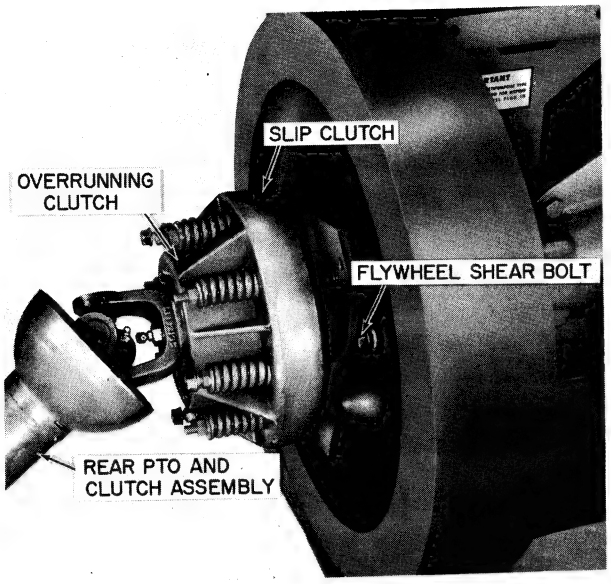


FIGURE 30

SHIELDS SHOWN OPEN FOR CLARITY.

After the baler has been stored for any length of time, the slip clutch should be checked to see that it has not become frozen due to rust. If it has, it will then be necessary to loosen each bolt slightly to allow the clutch to slip and polish the clutch surfaces.

IMPORTANT: Do not tighten the clutch beyond the 4800 in. lb. (542 N·m) torque setting and never adjust the bolts so the springs are fully compressed or damage to the PTO universal joints could result. Keep the clutch disc free from grease and oil.

The PTO drive slip clutch is designed to slip during high capacity baling. If baling at peak capacity, the slip clutch will heat. This clutch also will squeak when baling at high capacity and the clutch is slipping.

PTO DRIVE SLIP CLUTCH

The PTO drive slip clutch, Figure 31, acts in conjunction with the flywheel shear bolt, Figure 31, to protect the PTO drive shaft and the baler main components and cushions them against the peak loads imparted by the action of the plunger. The slip clutch also cushions the PTO drive against shock from engaging the tractor PTO suddenly. The clutch must be set to slip at 4800 in. lbs. (542 N·m) torque to function properly.

For an accurate torque setting, a bar and spring scale should be used. Lock the flywheel or plunger so the flywheel will not turn.

Place a bar between the universal joint yokes and attach the spring scale at a point on the bar 36" (94 mm) from the center of the PTO shaft. Put the spring scale at a right angle to the bar. For a 4800 in. lbs. (542 N·m) torque setting, a 133 lb. (592 N) pull on the scale is required to cause the clutch to slip. If adjustment is required, increase or decrease the compression on the clutch compression spring. It is important the springs be adjusted evenly so they all have the same compression. For a 4800 in. lbs. (542 N·m) torque setting, the length of the compresion springs should be approximately 1⅞" (42 mm).

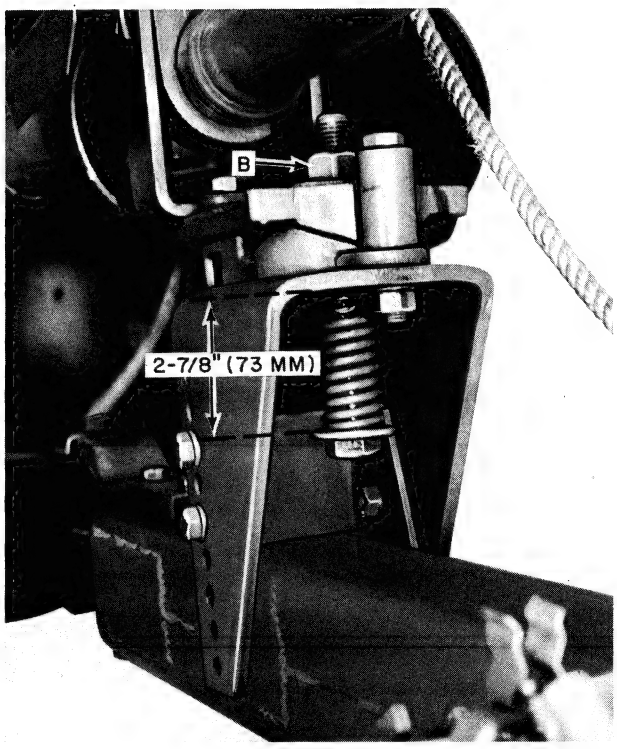


FIGURE 31

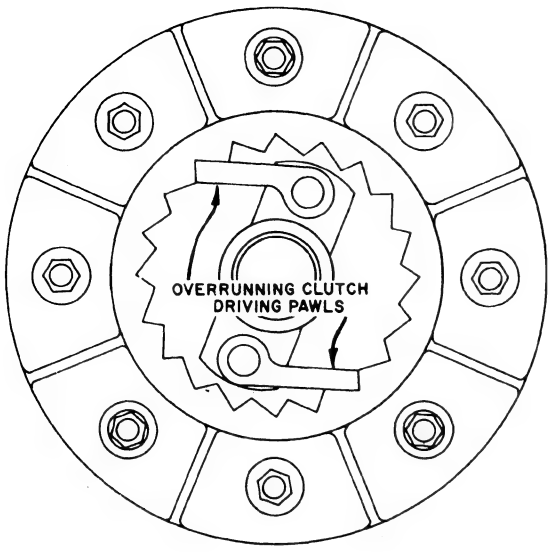


FIGURE 33

PTO OVERRUNNING CLUTCH

The overrunning clutch, Figure 33, allows the baler flywheel to "freewheel" when the PTO is disengaged or the tractor engine speed is reduced. This eliminates torque reversal in the PTO drive shaft and tractor transmission and reduces strain on these components. The overrunning clutch allows the operator to change gears without waiting for the baler flywheel to come to a complete stop.

The clutch is a ratchet type with two driving pawls as shown in Figure 33. If necessary, the clutch can be disassembled by removing the center bolt. When reassembling, be sure to install the driving pawls as shown in Figure 33.

POWER PIVOT - PTO SUPPORT

The power pivot pedestal is designed to maintain equal angle in the two front universal joints when a turn is being made. During sharp turns the top portion of the pedestal will rotate. After the turn is completed, the centering spring, shown in Figure 32, will return it to the center position. Adjust the spring with adjusting nut, B, Figure 32. After making an adjustment, push the pedestal toward one side or the other and make certain that the spring will return it to the center or neutral position.

The length of the spring on the bottom of the pivoting shaft should be adjusted to 2⅞" (73 mm) as shown in Figure 32.

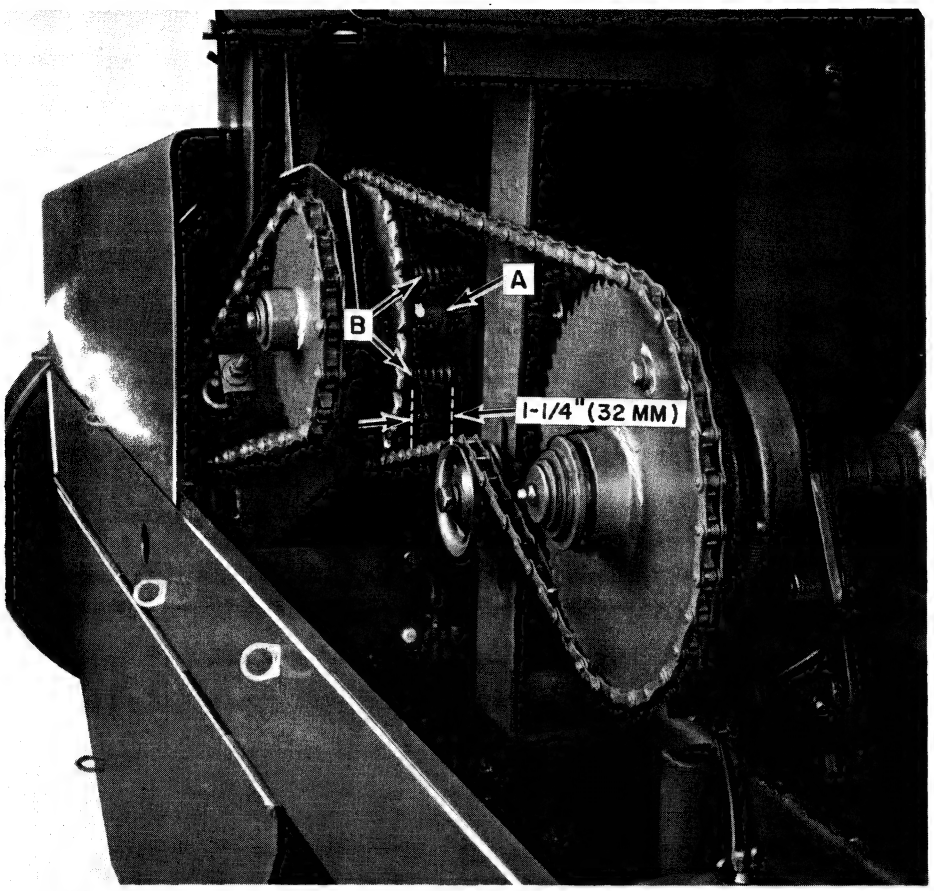
FLYWHEEL SHEAR BOLT

The flywheel shear bolt, Figure 31, protects the gearbox, plunger and related parts from damage. It is a special bolt supplied with the machine.

NOTE: Do not use any other bolt as a flywheel shear bolt.

The use of any bolt other than that specified may result in damage to the baler. Additional bolts are available from any authorized Sperry New Holland dealer.

Keep the shear bolt tight at all times.



SHIELDS SHOWN OPEN FOR CLARITY.

FIGURE 34

PICK-UP DRIVE OVERRUNNING CLUTCH

The pick-up overrunning clutch, shown at A, Figure 34, allows the pick-up to be driven in one direction only. This eliminates damage to the pick-up teeth and related parts should the flywheel be rotated backward.

The clutch simply consists of two spring-loaded pins which drive against lands on the clutch disc. For maximum life and efficient operation, these driving pins must be kept clean and lubricated with light oil. It is recommended that the overrunning clutch be disassembled, cleaned and lubricated at the start of each season.

PICK-UP DRIVE SLIP CLUTCH

The pick-up drive slip clutch is designed to protect the pick-up and related parts and to deliver a uniform flow of material into the feeding mechanism. For best performance and maximum capacity, it should be adjusted to slip at 1800 in. lbs. (203 N·m) so a uniform flow of material is carried into the machine and so it SLIPS WHEN THE MACHINE IS OVERFED or when an obstruction is encountered by the pick-up teeth.

To adjust the clutch, loosen the adjusting bolts, B, Figure 34, lock the pick-up and turn the flywheel to cause the clutch to slip and polish the clutch disc surfaces. Readjust the clutch adjusting bolts. Compress all five compression springs to measure 1¼" (32 mm) as shown in Figure 34. This will give the clutch a setting of approximately 1800 in. lbs. (203 N·m).

Definite signs of overfeeding are—

1. Continuous telescoping of the feeder tine bar.
2. Ragged, saw-tooth edges and five or six slices per bale.
3. Not enough material in left side of bale.
4. Low capacity.

When the slip clutch is set too tight, too much material can be forced into the feeder area and signs of overfeeding will result. When the pick-up and feeder areas are both overloaded the feeder tine bar continuously telescopes.

If the machine has been stored for any length of time, the slip clutch should be checked to see that it has not become "frozen" due to rust.

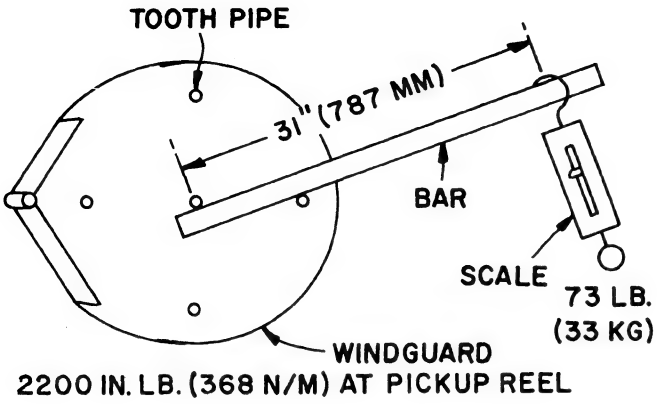


FIGURE 35

A more accurate setting can be obtained as follows:

1. Insert a 32"-34" (813-864 mm) bar into the pick-up (between pick-up guards) as shown in Figure 35.
2. Hook a spring scale on the bar 31" (787 mm) from the center shaft of the pick-up.
3. Hold the scale and turn the baler flywheel in the direction of operation.
4. Adjust the clutch springs so the clutch will slip when a force of 73 lbs. (325 N) is exerted on the scales.

PICK-UP SPEED

Your Model 320 Hayliner is equipped with a two-speed drive for the pick-up assembly, see sprocket, X, Figure 45.

To change pick-up speeds simply remove the sprocket from the shaft shown at X, Figure 45, turn it over and reinstall it on the shaft.

Using the chain on the smaller sprocket will increase the pick-up speed while using the larger of the two sprockets will operate the pick-up at the slower speed.

PICK-UP WIND GUARD

The wind guard, A, Figure 36, is designed to hold material firmly on the pick-up teeth for positive feeding.

A stop, shown at B, Figure 36, is provided to limit the travel of the wind guard fingers and prevent them from rubbing or bumping on the pick-up guards. Normally this stop should be adjusted so the wind guard fingers clear the pick-up guards by 3"-4" (76-102 mm). This of course, will vary depending on the size of the windrows and the type of material being baled.

Stop, C, Figure 36, is used to limit the upward travel of the wind guard. In light to medium windrows, the wind guard movement should be limited to 3"-4" (76-102 mm). Limiting the wind guard travel helps pre-compress the material before entering the feeder chamber.

Bale shape problems can be helped by varying this adjustment.

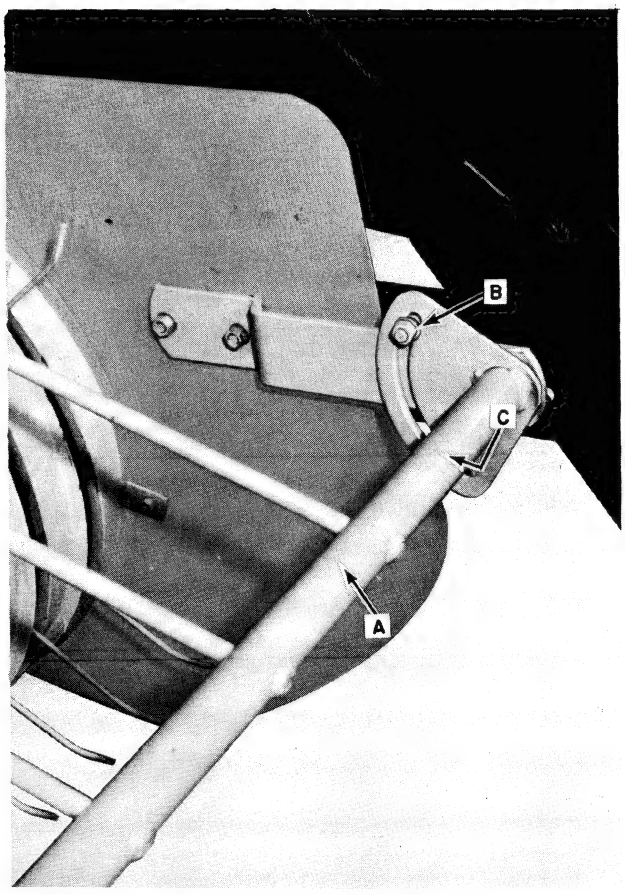


FIGURE 36

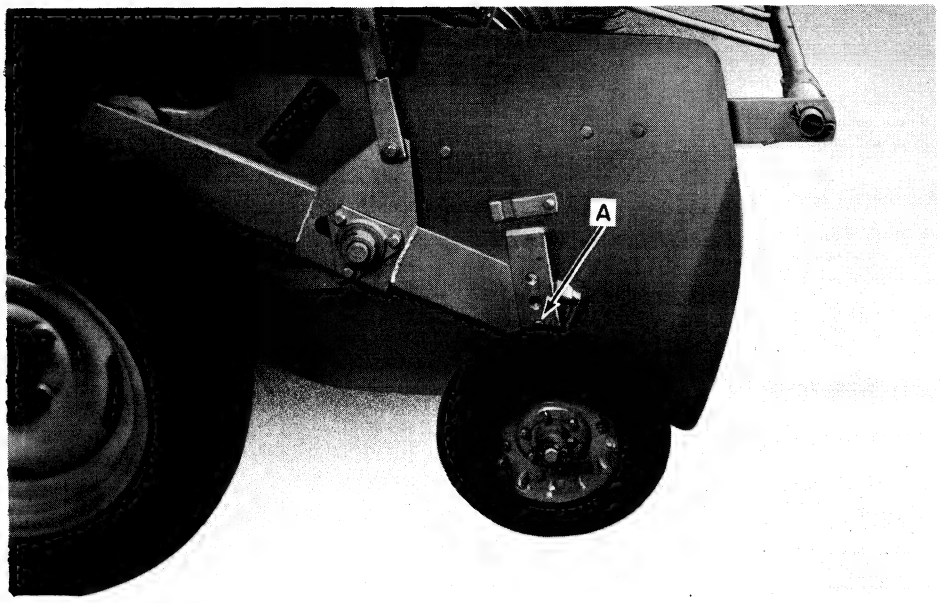


FIGURE 37

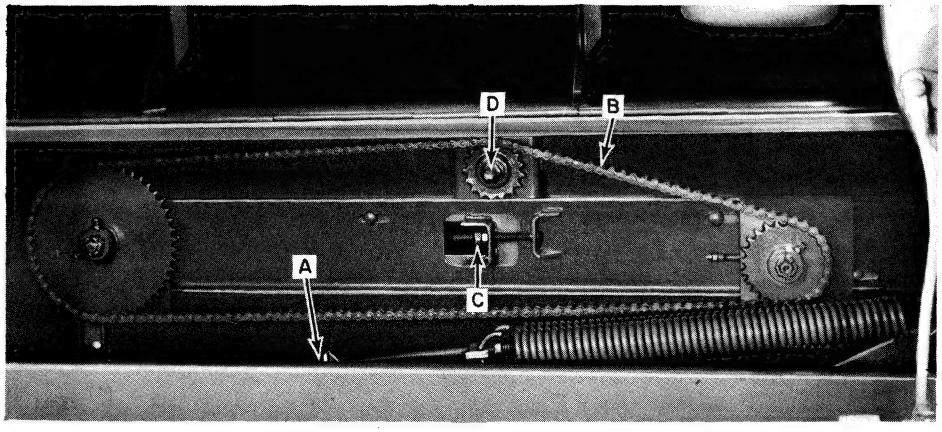
PICK-UP GUIDE WHEEL

The pick-up guide wheel is designed to prevent the pick-up teeth and guards from striking the ground.

The pick-up wheel bracket can be adjusted by moving the bolt, A, Figure 37, to any one of the four positions. For normal conditions it should be adjusted so the pick-up teeth clear the ground by 2" (50 mm).

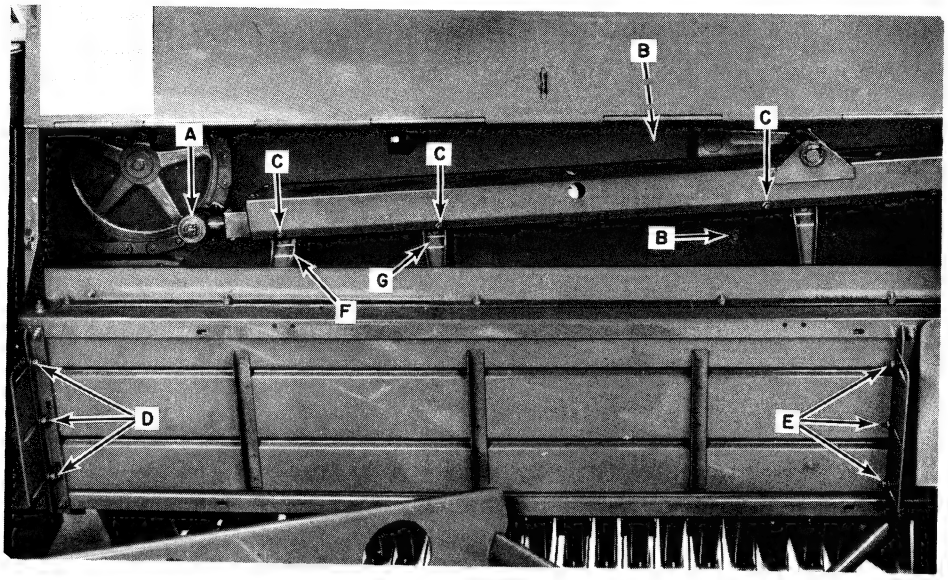
PICK-UP FLOTATION SPRING

A pick-up flotation spring carries most of the weight of the pick-up and provides a floating action. It should be adjusted at A, Figure 38, until there is 25-30 lbs. (111-133 N) weight on the pick-up wheel. It is important that the majority of the weight of the pick-up be carried on the flotation spring to keep the load on the guide wheel to a minimum. This will reduce the wear on the wheel and prevent it from becoming damaged. However, the spring must not be tightened to the point where the pick-up will bounce up and miss hay when baling light windrows.



SHIELDS SHOWN OPEN FOR CLARITY.

FIGURE 38



SHIELDS SHOWN OPEN FOR CLARITY.

FIGURE 39

FEEDER

The feeding system consists of a telescoping tine bar shown in Figure 39. It is driven by the tine bar drive chain. The tine bar attaches to the tine bar drive chain with a connector link and pin at A, Figure 39.

The right end of the tine bar assembly is attached to a crank arm shown in Figure 40. As the tine bar operates the left end follows the drive chain and the right end follows the crank arm.

As the tine bar moves toward the bale chamber the left end telescopes out toward the bale chamber and then retracts on the way back to pick up another charge of hay. There are several adjustments that affect operation of this feeding system. (See "Bale Shape" section).

CAUTION: THE TINE BAR IS SPRING LOADED. DO NOT ATTEMPT TO DISASSEMBLE WITHOUT THE ASSISTANCE OF AN AUTHORIZED SPERRY NEW HOLLAND DEALER.

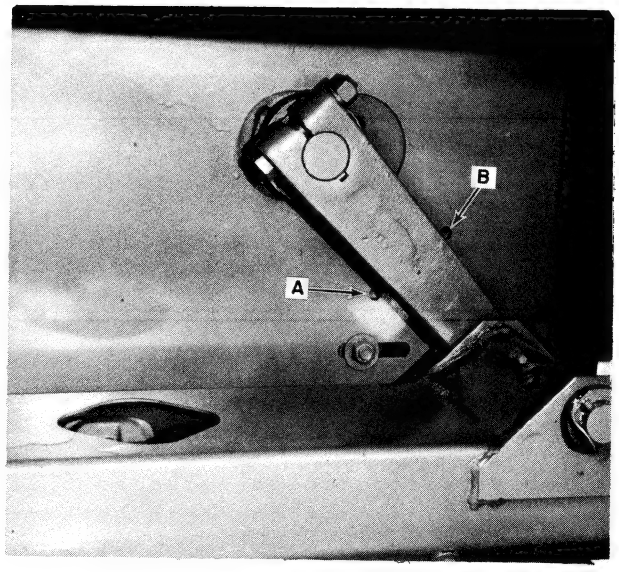


FIGURE 40

SHIELDS SHOWN OPEN FOR CLARITY.

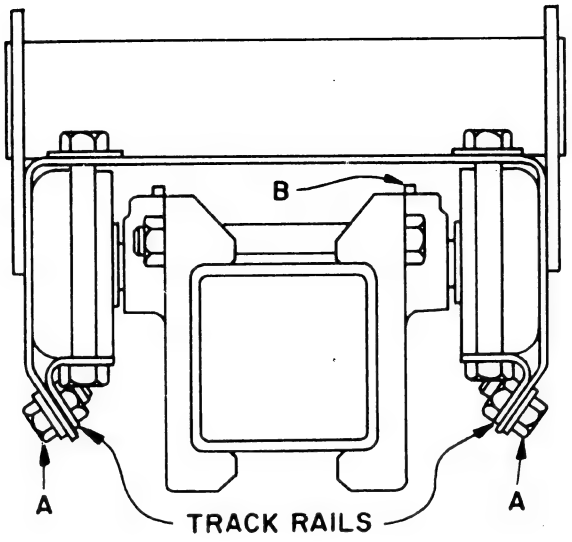


FIGURE 41

TINE BAR BEARINGS

To provide a smoother, quieter and longer bearing life it will be necessary to occasionally adjust the track rails, Figure 41. Maintain a vertical clearance of 0.010"-0.030" (0.25-0.50 mm) between rollers and track rails the entire length of roller travel. To adjust vertical clearance loosen bolts, A, Figure 41. Bolts also shown at C, Figure 39.

The front roller should be adjusted to maintain a horizontal clearance of not more than 0.015" (0.38 mm) at the tightest point. Obtain this adjustment by loosening set screws, B, Figure 41. Horizontal clearance should not exceed 1/16" (1.6 mm) at any point. Retighten set screws to 20-23 ft. lbs. (27-31 N·m).

Spacer washers should be installed between the bearing and its holder to close any space between the bearing and its holder. The spacer washers are available from your Sperry New Holland dealer.

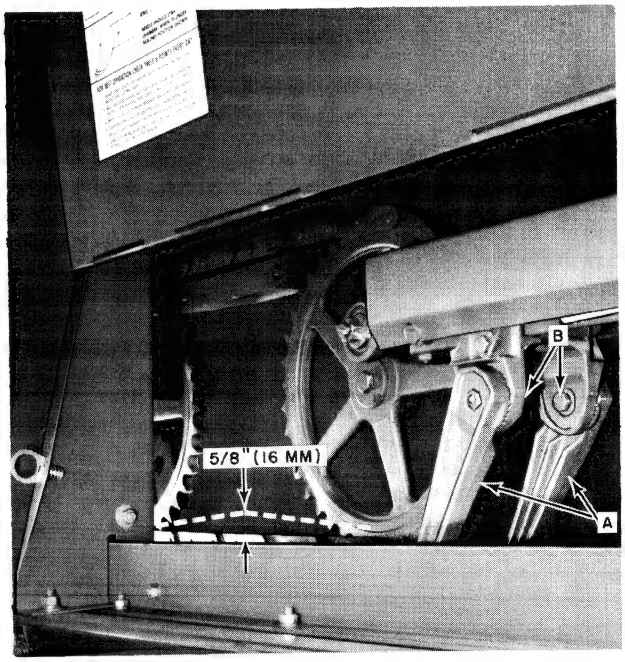
TINE BAR DRIVE CHAIN

The tine bar drive chain, Figure 42, should be kept tight at all times. To adjust it, loosen bolts, B, Figure 39, and bolts, A, Figure 42.

NOTE: Make sure tine bar connector link is positioned on sprocket as shown at A, Figure 39, when tightening chain. This will prevent excessive chain tightness when connector link runs over sprocket teeth.

Tighten chain at C, Figure 37, until a force of 100 lbs. (445 N) will deflect chain ⅝" (16 mm) midway between sprockets, Figure 42.

NOTE: Never remove any links from tine bar drive chain.



SHIELDS SHOWN OPEN FOR CLARITY.

FIGURE 42

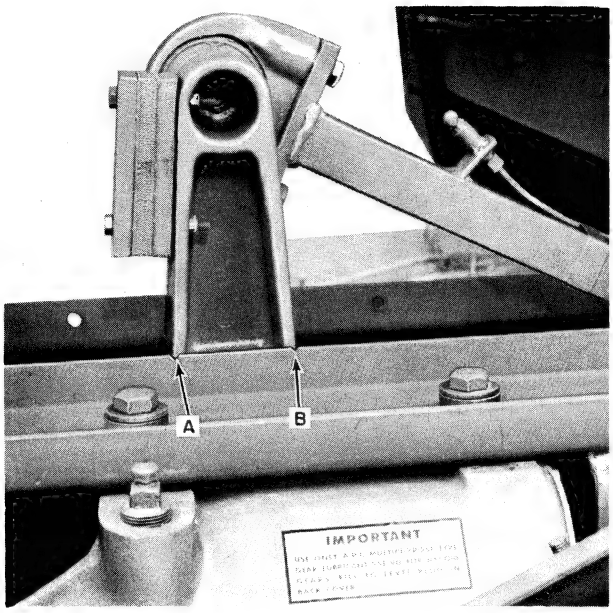


FIGURE 43

SHIELDS SHOWN OPEN FOR CLARITY.

SHIELDS SHOWN REMOVED FOR CLARITY.

FEEDER CRANK DRIVE CHAIN

The feeder crank drive chain, B, Figure 39, should be kept moderately tight at all times. Tighten chain by adjusting idler sprocket, D, as required.

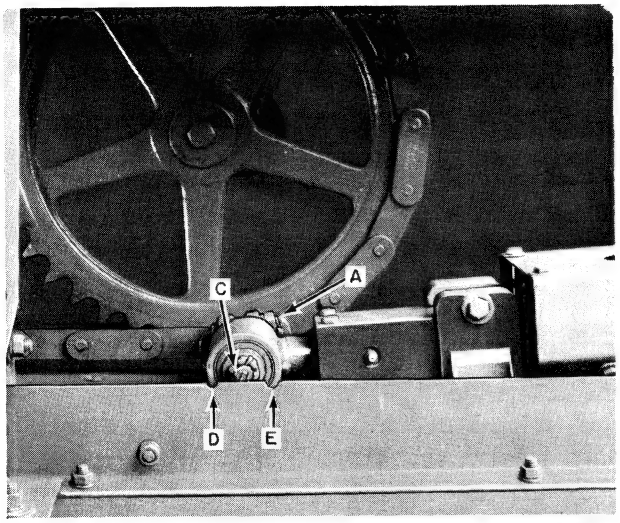
TINE BAR TIMING

The tine bar is timed with respect to the movement of the plunger. This is necessary to feed uniformly into the bale chamber and prevent the plunger from striking the feeder tines.

Timing marks on the baler make it very easy to check for proper tine bar timing. Proceed as follows:

Turn the flywheel in the direction of rotation until the main crank is in a vertical position between the two marks, A and B, Figure 43. At this time the tine bar drive pin, C, Figure 44, should be between the two timing marks at D and E, on the rear feeder support angle.

If the tine bar driven pin is not between the timing marks as shown in Figure 44, the tine bar assembly is out of time and must be retimed.

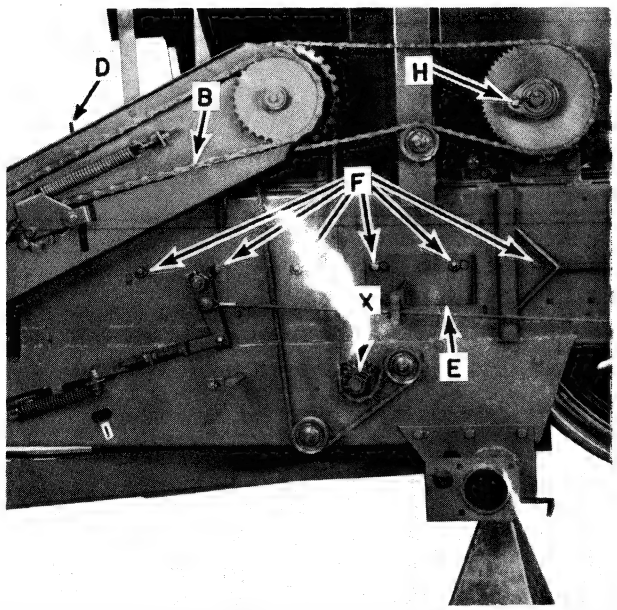


SHIELDS SHOWN OPEN FOR CLARITY. FIGURE 44

To time the tine bar properly, proceed as follows:

1. Remove the drive chain guard.
2. Remove the main drive chain. See B, Figure 45.
3. Turn the flywheel in the direction of rotation until the main crank is in the vertical position as shown in Figure 43.
4. Move the tine bar into the position shown in Figure 44.
5. MODEL 320 SERIAL NUMBER 520822 AND BELOW

   Install the main drive chain with the top drive chain as tight as possible and adjust the chain tightener so the spring length is 11⅜" (298 mm). Do not adjust eye bolt holding spring — adjust bolt, D, Figure 45, to obtain proper spring length.



SHIELDS SHOWN REMOVED FOR CLARITY. FIGURE 45

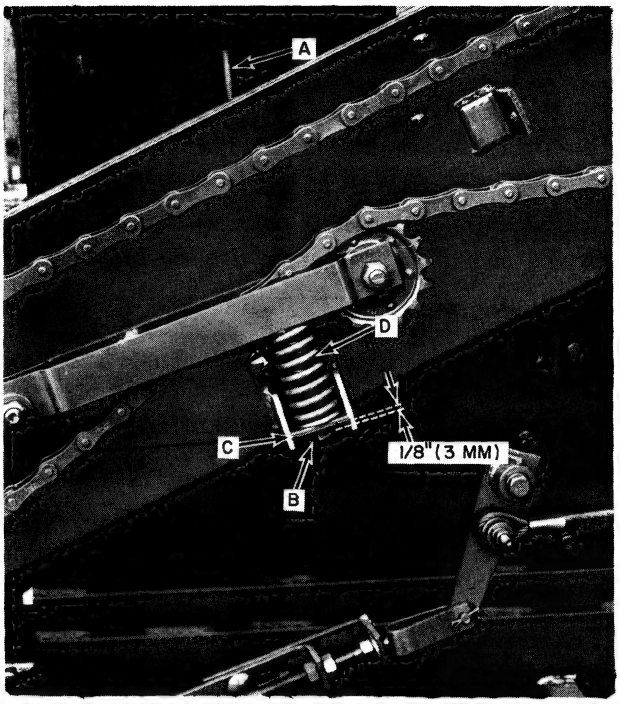


FIGURE 45A

SHIELDS SHOWN REMOVED FOR CLARITY.

MODEL 320 SERIAL NUMBER 520823 AND ABOVE.

Install the main drive chain with the top strand as tight as possible and adjust draw bolt, A, until there is ⅛" (3 mm) clearance between nut, B, and bracket, C, Figure 45A.

Should it be necessary to disassemble the chain tightener for repair, when reassembling, tighten nut, B, Figure 45A, until spring, D, Figure 45A, is compressed to a length of 3-5/16" (84 mm) **before** tensioning the chain.

6. Turn the flywheel in the direction of rotation until the main crank has made one complete revolution and then recheck the tine bar timing.
7. Install the chain guard.

CRANK ARM TIMING

The crank arm must be timed in relationship to the tine bar. When the tine bar drive pin is in the position shown in Figure 44, the crank arm must be in the position shown in Figure 40, between timing marks, A and B. If it is not, remove feeder crank drive chain shown in Figure 38, rotate crank arm to proper position and reinstall chain and tension drive chain.

After all adjustments have been made turn the machine through a complete cycle and recheck all timing marks.

NOTE: Always check needle drive timing after adjusting tine bar timing.

TINE BAR REMOVAL

If the tine bar and the movable track are removed, the tine bar should be removed from the tine bar drive chain by removing the cross bolt, A, Figure 44, from the tine bar drive pin and leaving the pin in the tine bar. The right end should be removed by removing the cross bolt from the movable track pin at A, Figure 46, and leave the crank arm on the baler. **The crank arm should not be removed because the pre-load will be changed on crank arm shaft bearings.** If the pre-load is not correct, it can be adjusted by tightening or loosening the nut, D, Figure 46, so there is 4-6 in. lbs. (0.1-0.7 N·m) of pre-load on bearings shown in Figure 46.

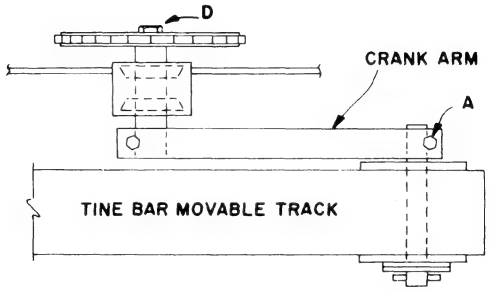


FIGURE 46

BALE SHAPE - FEEDER TINES

The tines are located on the tine bar at the factory in a position that will produce uniform bales for most of the baling conditions.

Several adjustments are provided to compensate for the many variables that could be encountered during baling.

In some cases, it may be necessary to move the left and center tines, F and G, Figure 39. If too much material is being placed on the right side of the bale, move the left tine in or to the left 1"-2" (25-50 mm) at a time until good bale shape is obtained. The center tines should be moved to the right about the same amount of distance the left tine is moved to assist in getting a good bale shape. Additionally, the left feeder tines, A, Figure 42, are adjustable in angularity. It may be necessary to change the angularity to assist in obtaining good bale shape. To change the angularity, loosen bolts, B, Figure 42, so the tines, A, Figure 42, can be rotated from the straight down position to 30° to the left. The fingers and holders are serrated and allow movements in increments of 10°. DO NOT INCREASE THE ANGLE OF THE FINGERS TO THE LEFT MORE THAN 30°. Interference between the tips of the fingers and the top of the bale case may be the result.

After making any of the adjustments above, be sure to rotate the baler through one complete cycle to be sure the tines do not interfere with the bale case at any point. It may be necessary to make further tine adjustments for good bale shape under adverse conditions. If too much hay is placed on the right side of the bale, reverse the procedure for adjusting tines.

The baler is also equipped with an adjustable feeder back as shown in Figure 39. Bolts, D and E, Figure 39, hold the feeder back in position. By loosening these bolts, the feeder back can move forward or rearward as desired or required.

Generally, if the windrows are medium to large in size, the feeder back can be in its rearmost position. When the windrows are light and bales do not have enough material in the left side, moving the feeder back forward will help produce bales with more material in the left.

With the feeder back in the rearmost position, bales will tend to have more material in the right side and with the feeder back forward, the bales will generally have more material in the left side.

BALE SHAPE — PICK-UP SLIP CLUTCH

Adjustment of the pick-up drive slip clutch can have a very definite effect on bale shape. If the clutch is too tight, overcrowding of the feeder results, and bales are produced which do not have enough material in the left side of the bale. Therefore, if a problem is encountered with not enough material in the left side of the bale, check and readjust the pick-up drive slip clutch.

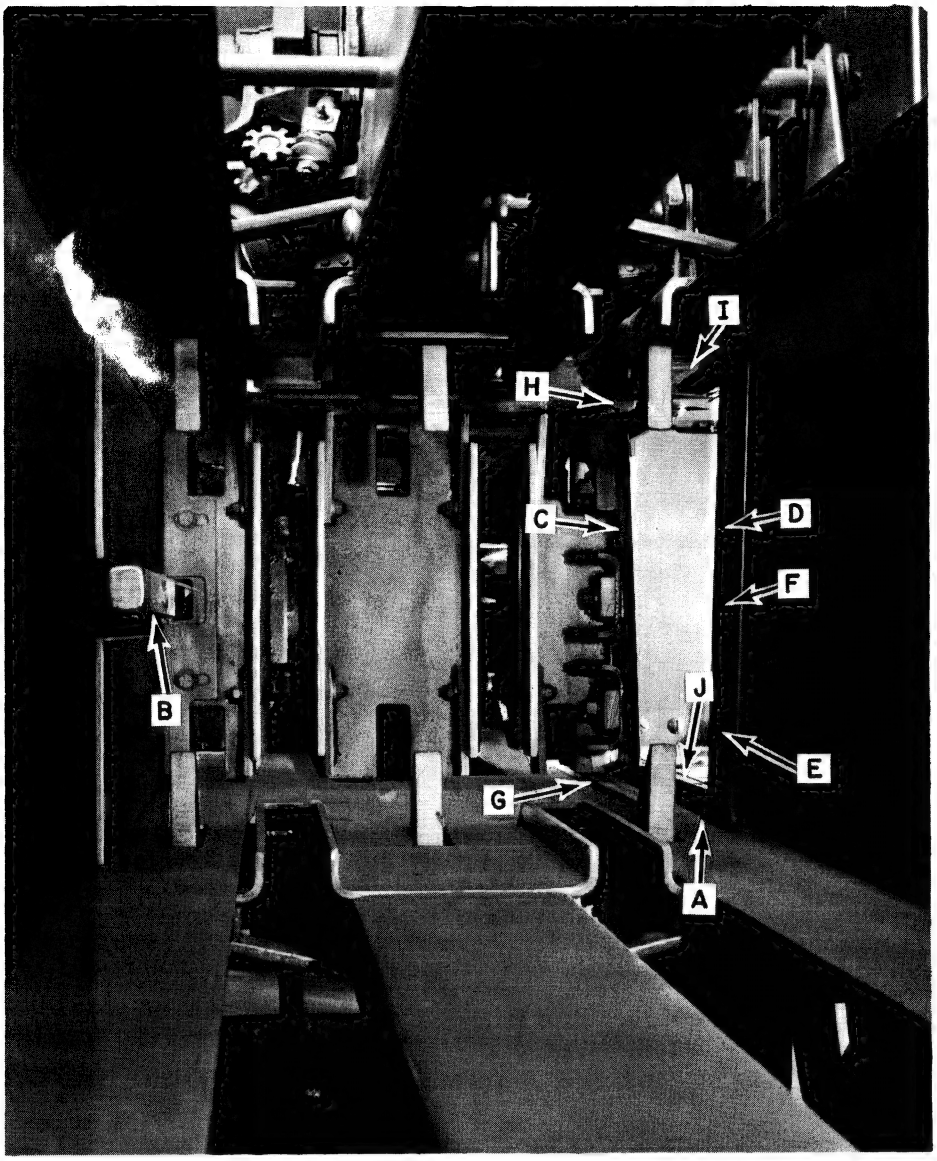


FIGURE 47

PLUNGER BEARING AND KNIFE ADJUSTMENT SERIAL NUMBER 571010 AND BELOW

Since the plunger on the Model 320 Hayliner baler is equipped with sealed roller bearings, frequent adjusting of the knives should not be necessary. However, plunger bearings and knives should be checked every 10,000 to 15,000 bales. Sharpen knives and adjust bearings as necessary.

When properly adjusted, distance between the knife mounted on the plunger at C, Figure 47, and the stationary knife, D, Figure 47, should be from 0.010"-0.030" (0.3-0.8 mm) when measured at the points where the knives cross near the bottom, the center, and the top.

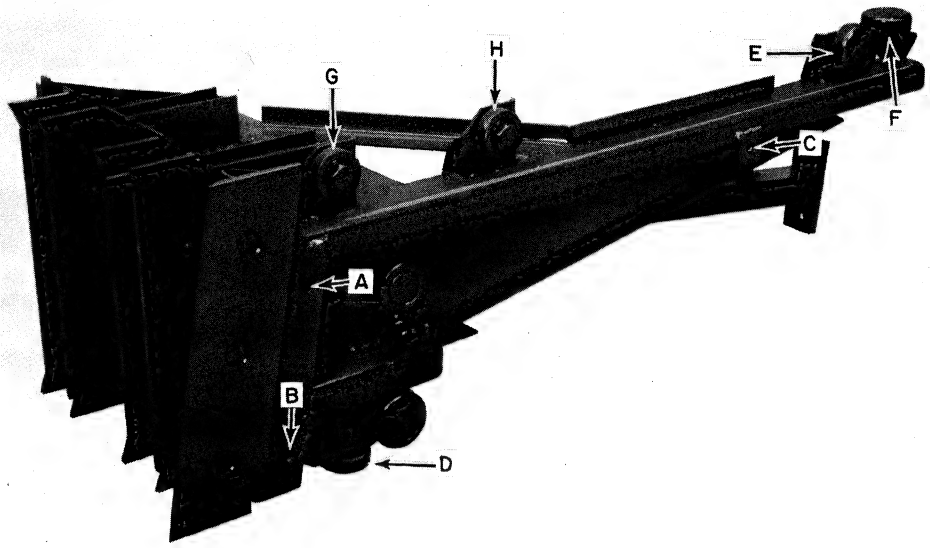


FIGURE 48

Figures 48 and 49 show the plunger removed from the baler. In Figure 48, bearings, D, G and H, are adjustable. In Figure 49, bearings, D and A, are adjustable.

Before making any plunger or bearing rail adjustments, examine all of the plunger bearings for excessive wear, missing grease seals, flat spots, or roughness. Replace the bearings as necessary.

All plunger rails should be examined for wear, etc., and replaced as necessary.

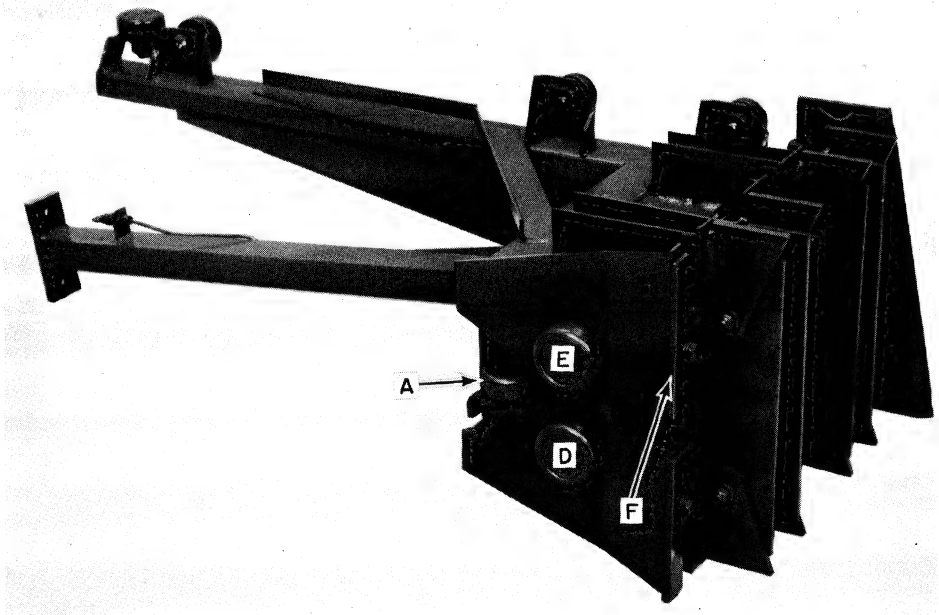


FIGURE 49

After the worn parts are replaced, follow the steps below to obtain correct plunger adjustment.

1. Install the stationary knife to the bale case as shown at D, Figure 47.

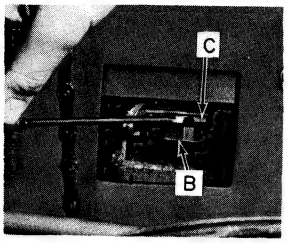
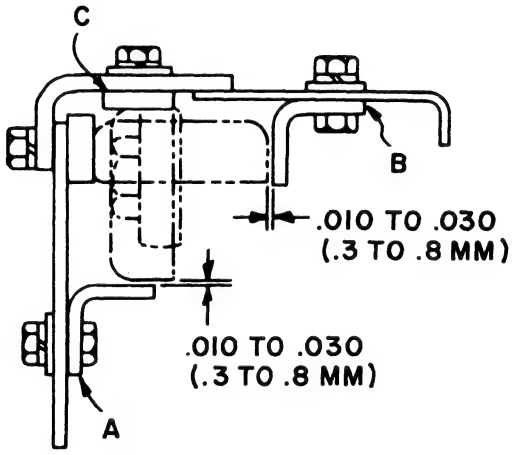


FIGURE 50

SAFETY SHIELDS REMOVED FOR CLARITY.

2. Lay a straight edge along rail, J, Figure 47, and measure the distance between the straight edge and lower portion of the knife at A, Figure 47. There should be between 0.005"-0.015" (0.1-0.3 mm) clearance between the straight edge and bottom of the knife. Remove or install shims as required under bolt, F, Figure 47, until the correct clearance is obtained.
3. Install the knife on the plunger as shown in Figure 48, using two of the thin shims between the knife and knife supports on the plunger. Tighten the bolts to 82 ft. lbs. (111 N·m) torque.
4. Install the plunger into the baler and attach the plunger connecting rod to the crank. Tighten the crank bolts to 82 ft. lbs. (111 N·m) torque.
5. Before making any adjustments, turn the flywheel in the direction of rotation so the plunger goes through two or three cycles and gets settled into the bale chamber.
6. Check the clearance between the top of the plunger and the top of the bale case on the top right hand corner of the plunger. This distance should be from ⅛"-¼" (0.3-0.6 mm) from the top of the bale case. If the clearance is more than ¼" (0.6 mm) shims are available to install under rail, G, Figure 47.
7. After obtaining the correct clearance on the top right of the plunger, check the clearance at the top left side of the plunger. Adjust rail, B, Figure 47, until the top of the plunger is parallel with the top of the bale case. Bolts, F, Figure 45, are used for this purpose. Be sure that rail, B, Figure 47, is parallel to the bottom of the bale case so that the plunger does not try to twist as it moves through its cycle.
8. Bearing, D, Figure 49, should be adjusted vertically so there is from 0.010"-0.030" (0.3-0.8 mm) clearance between bearing, D, Figure 49, and rail, B, Figure 47.



FRONT VIEW OF UPPER RIGHT FRONT CORNER OF BALE CASE

FIGURE 51

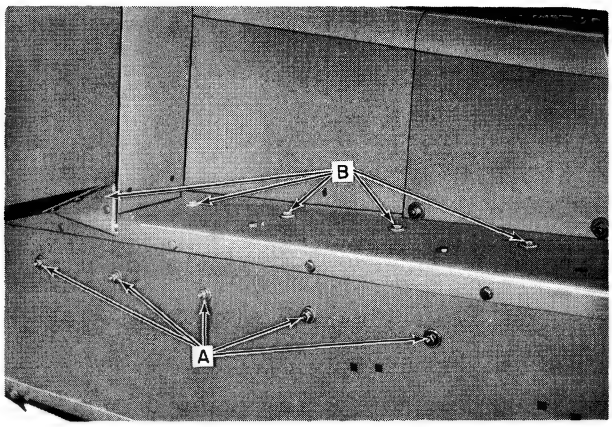


FIGURE 52

9. Adjust rail, A, Figure 51, so the clearance between bearing, E, Figure 48, and rail, C, Figure 51, is 0.010"-0.030" (0.3-0.8 mm). Bolts, A, Figure 52, are used for this adjustment.
10. Adjust rail, B, Figure 51, so there is 0.010"-'0.030" (0.3-0.8 mm) clearance between the bearing, F, Figure 48, and rail, B, Figure 51. Bolts, B, in Figure 52, are used in this adjustment.
11. Adjust bearing, D, Figure 48, so there is 0.005"-0.015" (0.1-0.3 mm) clearance between the tip of the knife and the rail, J, Figure 47. Be sure that bearing, D, Figure 48, is against the rail, J, Figure 47, when checking the clearance.
12. Bearing, A, Figure 49, should now be adjusted to rail, B, Figure 47. Access to the bearing is obtained through a hole in the side of the bale case as illustrated in Figure 50. Loosen lock nut, B, Figure 50, and rotate cam, C, Figure 50, to adjust bearing, A, Figure 49, to within 0.010"-0.030" (0.3-0.8 mm) clearance between the bearing and the rail, when bearing, D, Figure 48, is against rail, J, Figure 47.
13. Check the clearance between the knives as they start to cross at the bottom. The clearance should be from 0.010"-0.030" (0.3-0.8 mm). After obtaining the proper clearance at that point, rotate the flywheel in the direction or rotation until the knives are crossing in the center and check the clearance between the knives at the center and again at the top for proper clearance. It may be necessary to add or remove shims from either the stationary knife or the plunger knife in order to obtain these adjustments.
14. Adjust bearing, H, Figure 48, to rail, H, Figure 47. The clearance between the bearing and the rail should not exceed 0.030" (0.8 mm) at any point in the plunger travel.
15. Adjust bearing, G, Figure 48, to rail, I, Figure 47. The clearance between bearing, G, and rail, I, should not exceed 0.030" (0.8 mm) at any point along that short rail.
16. The plunger shield may now be installed. It is secured with three bolts located at A, B and C, Figure 48.

NOTE: The plunger should be moved through its entire cycle to be sure the clearances for the plunger bearings are the same through the entire cycle of the plunger and there is no binding at any point.

17. Adjust plate, F, Figure 49, to the left so it clears the side of the bale case by 1/32" (0.8 mm) at the closest point of the plunger to the bale case throughout the plunger's travel.

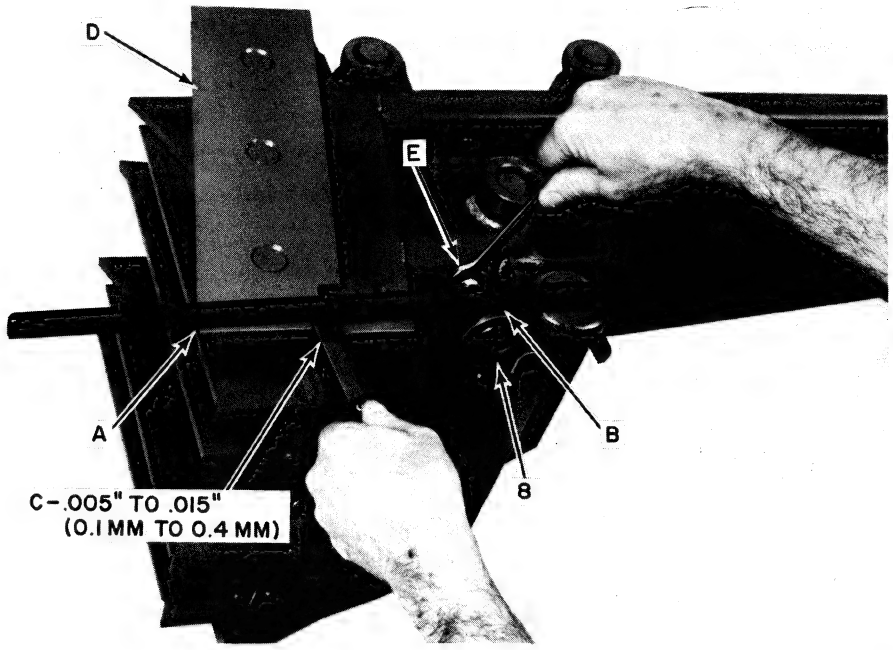


FIGURE 53

PLUNGER BEARING AND KNIFE ADJUSTMENT ON SERIAL NUMBER 571011 AND ABOVE

The plunger bearing and knife adjustment should be checked every 15,000 to 20,000 bales. Adjust clearances as necessary.

Knives must be kept sharp and adjusted for clean cutting and efficient operation.

When properly adjusted, the clearance between the plunger knife, A, and stationary knife, B, Figure 54, should be .010"-.030" (.3 to .8 mm).

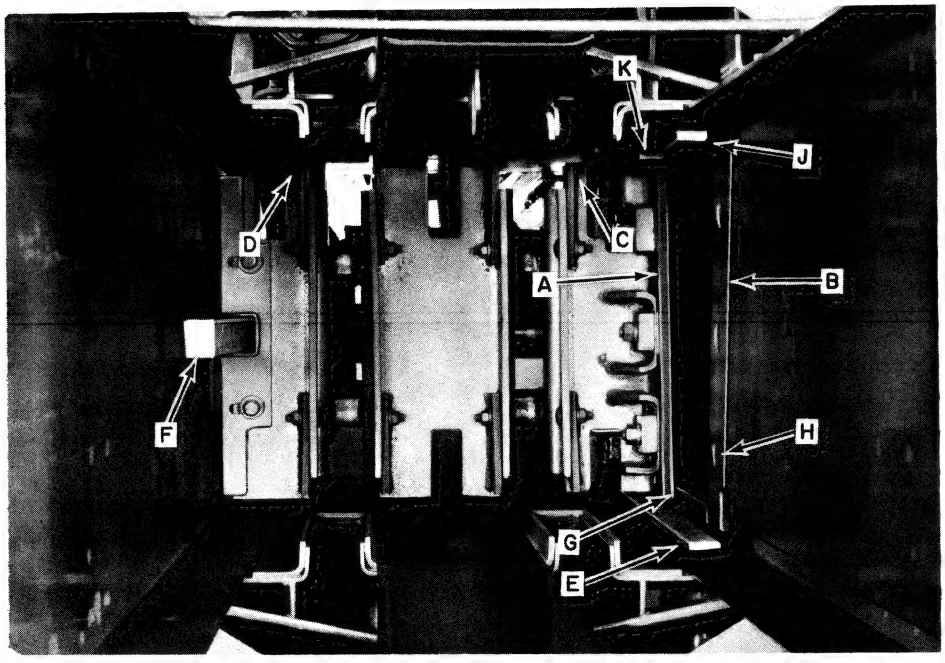


FIGURE 54

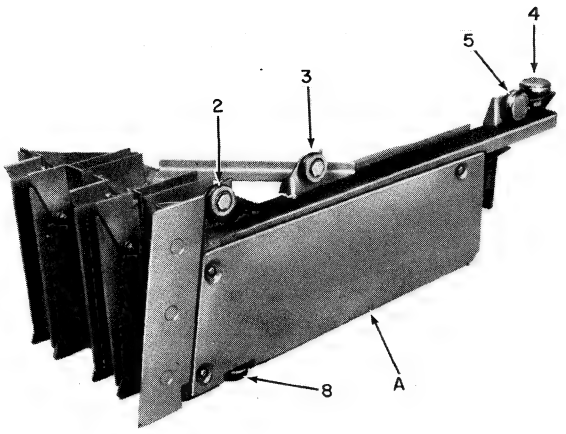


FIGURE 55

Figures 55 and 56 show the plunger removed from the baler. Bearings 2, 3, 6, 7 and 8 are adjustable.

Figure 58 shows the bale case with the plunger removed. Plunger rails 1 and 2 are adjusted with shims. Plunger rails 3, 4, 5 and 6 are adjustable.

To remove the plunger, disconnect the connecting rod, A, Figure 56, from the crank, C, Figure 58, by removing two cap screws. Slide the plunger rearward out of the bale case.

CAUTION: INJURY COULD RESULT FROM BEING PINCHED BETWEEN THE PLUNGER AND BALE CASE. DO NOT HOLD OR OTHERWISE MOVE THE PLUNGER BY GRASPING IN THE KNIFE AREA.

After the plunger is removed, carefully inspect the bearings for wear, flat spots, missing seals, or roughness when turning. Replace as necessary.

The plunger guide rails in the bale case should be inspected for wear, which is indicated by grooves worn by the bearings. Replace as necessary. If a rail must be replaced, and it was shimmed, be sure to install the shims in their original location to assure the rail is straight.

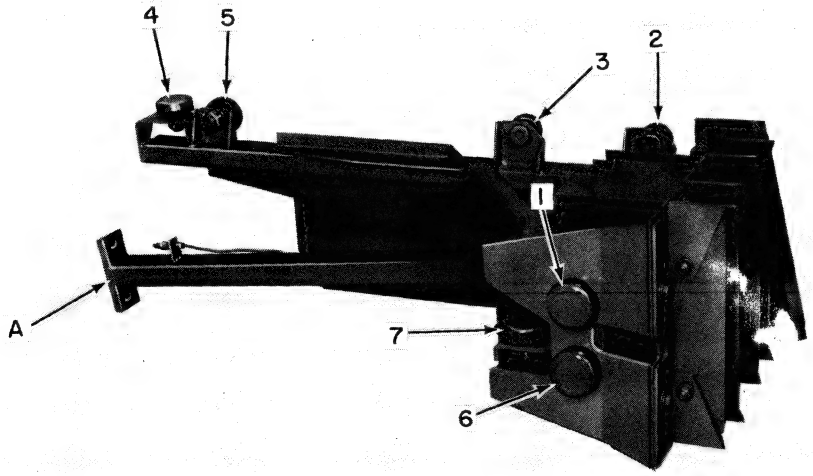


FIGURE 56

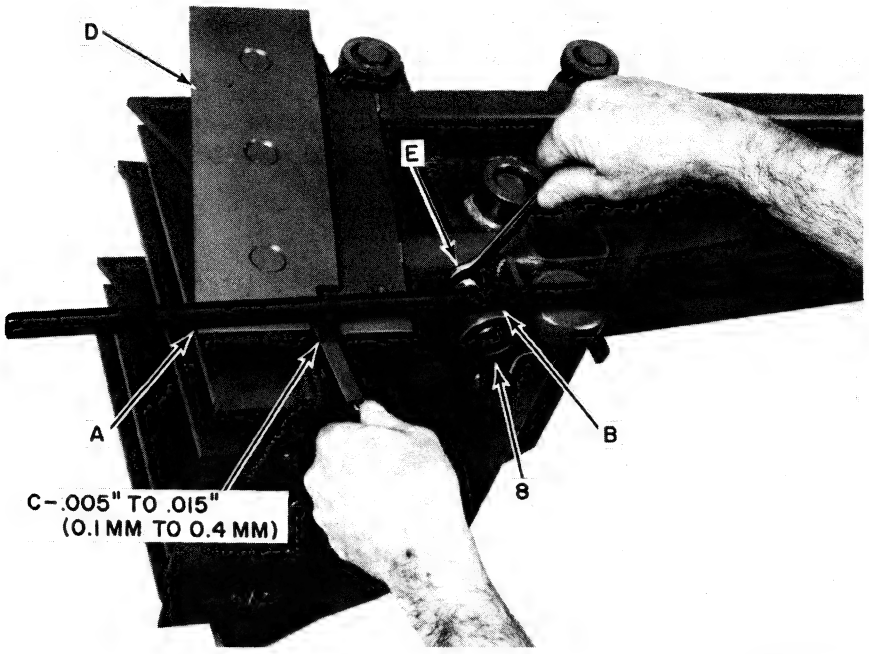


FIGURE 57

When adjusting the plunger bearings, rails and knives, follow these steps:

1. Before installing the plunger, mount the knife, D, Figure 57, on the plunger. Tighten the bolts securely. Make sure the knife is straight by laying a straight edge across the knife mounting bolts. If there is more than .015" (.4 mm) clearance between the straight edge and knife, a shim or shims must be installed between the knife and mounting pad. Tighten the bolts and recheck.
2. The distance between bearings 1 and 6, Figure 56, can be adjusted before installing the plunger. The distance should be at least 1.255" (31.9 mm) and not more than 1.270" (32.3 mm). To adjust bearing 6, Figure 56, remove the shield, A, Figure 55. A socket and long extension will be needed to adjust the bearing vertically. Tighten the nut to 170-185 ft. lbs. (230-251 N·m).
3. With shield, A, Figure 55, removed, adjust bearing 8, Figure 57. Lay a straight edge across the knife and bearing as shown in Figure 57. The straight edge should touch the knife at A and bearing, 8, at B, Figure 57. Adjust stud, E, Figure 57, until a clearance of .005" to .015" (.1 to .4 mm) is obtained at C, as shown. Tighten the locking nut for stud, E, and recheck the clearance at C. Install shield, A, Figure 55.
4. Before installing the plunger in the bale case, block the top right and bottom right hay dogs out of the bale chamber. They will interfere with the plunger if not blocked out.

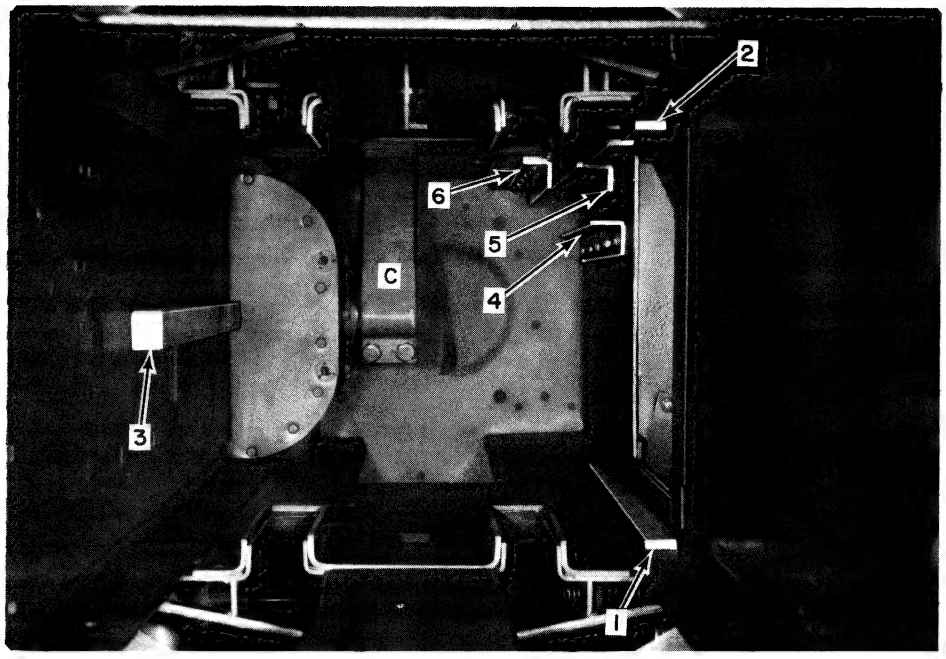


FIGURE 58

5. Install the plunger in the bale chamber and attach the connecting rod, A, Figure 56, to the crank, C, Figure 58. Torque the two cap screws to 80 to 85 ft. lbs. (108 to 115 N·m). Rotate the flywheel in the direction indicated by the arrow on the front of the flywheel so the plunger cycles several times.

6. Check the clearance between the plunger and top of the bale case at C, Figure 54. The clearance must not exceed ⅛" (3 mm) at the closest point in plunger travel. If the clearance exceeds ⅛" (3 mm), install a long shim, available through Service Parts, between rail, E, Figure 54, and the bottom of the bale case.

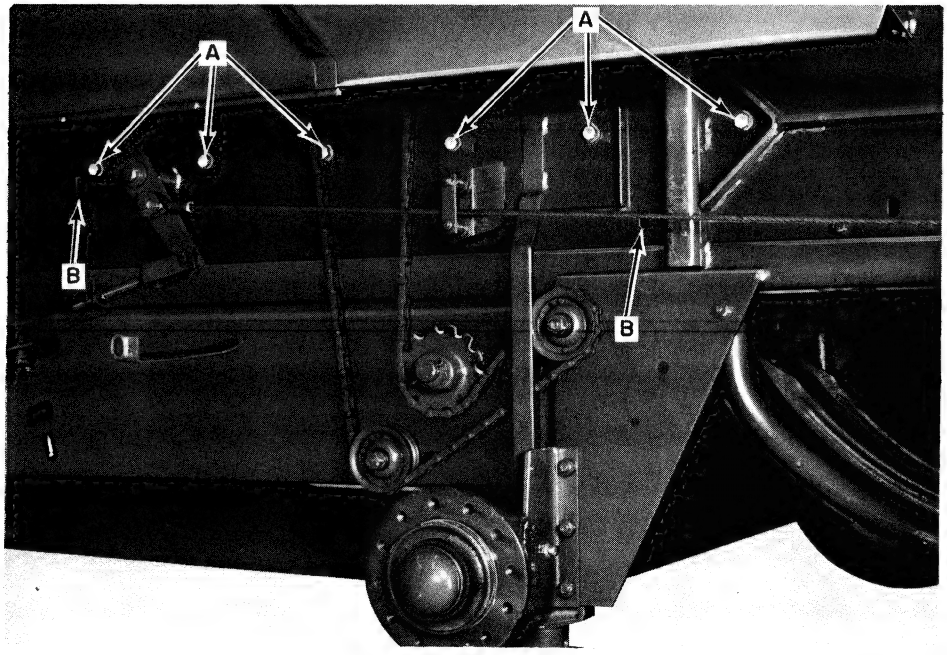


FIGURE 59

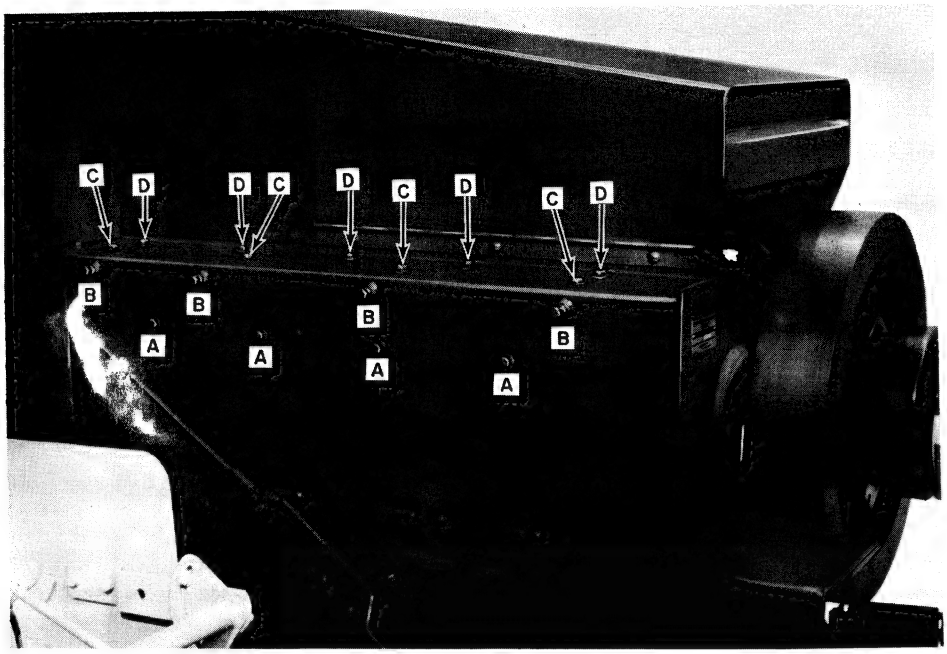
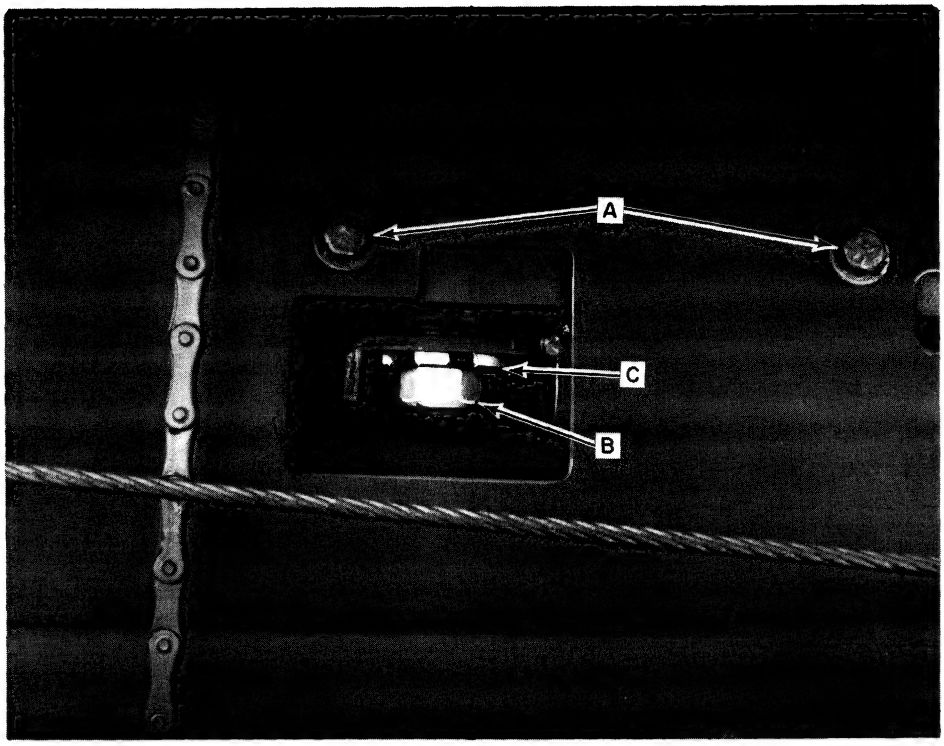


FIGURE 60

7. Check the clearance between the top of the plunger and top of the bale case at D, Figure 54. The clearance must not exceed ⅛" (3 mm) at the closest point in plunger travel. To adjust the clearance, use bolts, A, Figure 59. Slots, B, Figure 59, are provided so a punch can be used to move the rail. Be sure the rail is parallel to the bottom of the bale case when the bolts are tightened.

8. Adjust rail, 4, Figure 58, to obtain .010"-.030" (.3-.8 mm) clearance between bearing, 5, Figure 55 and rail, and bearing. Bolts, A, Figure 60, are used for this adjustment.



SHIELDS SHOWN REMOVED FOR CLARITY.

FIGURE 61

9. Adjust eccentric bearing, 7, Figure 56, to obtain .010" to .030" (.3 to .8 mm) clearance between rail, F, Figure 54, and bearing, 7, Figure 56. Be sure bearing, 8, Figure 55, is against rail, G, Figure 54, when checking the clearance. Access to bearing, 7, Figure 56, is obtained through the opening in the left side of the bale case as shown in Figure 61. Loosen bolts, A, to remove the shield. Loosen nut, B, Figure 61, and turn cam, C, with a punch to adjust the bearing. Tighten nut, B, Figure 61, to 175-185 ft. lbs. (230-251 N·m).

10. Move the plunger to the front of its travel. Grasp the plunger in the area of bearings, 4 and 5, Figure 55. Move the plunger sideways until the connecting rod is centered on the pin in the plunger. Move rail, B, Figure 62, against bearing, 4, Figure 55. Tighten only the front bolt, D, Figure 63, at this time. Rotate the flywheel in the direction of rotation until the plunger is at the rearmost position. Repeat the process to center the connecting rod on the plunger pin. After carefully moving rail, B, Figure 62, against bearing, 4, tighten rearmost bolt, D, Figure 60. Move the plunger to the forwardmost position. Hold bearing, 4, Figure 55, against rail, B, Figure 62. If the connecting rod is centered on the plunger pin, tighten all bolts, D, Figure 60.

11. Adjust rail, A, Figure 62A, using bolts, B, Figure 60, to obtain .010" to .030" (.3 to .8 mm) clearance between bearing, 4, Figure 55, and rail, B, Figure 62. Tighten bolts, C, Figure 60, and nuts, F, Figure 62.

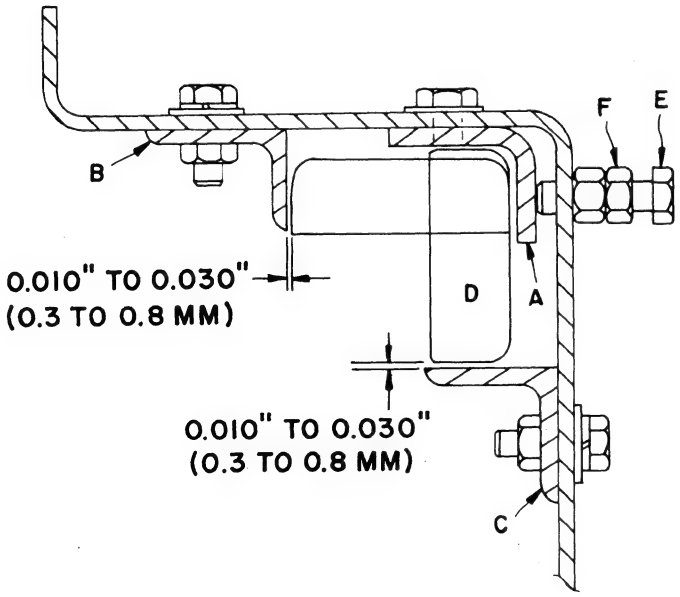


FIGURE 62

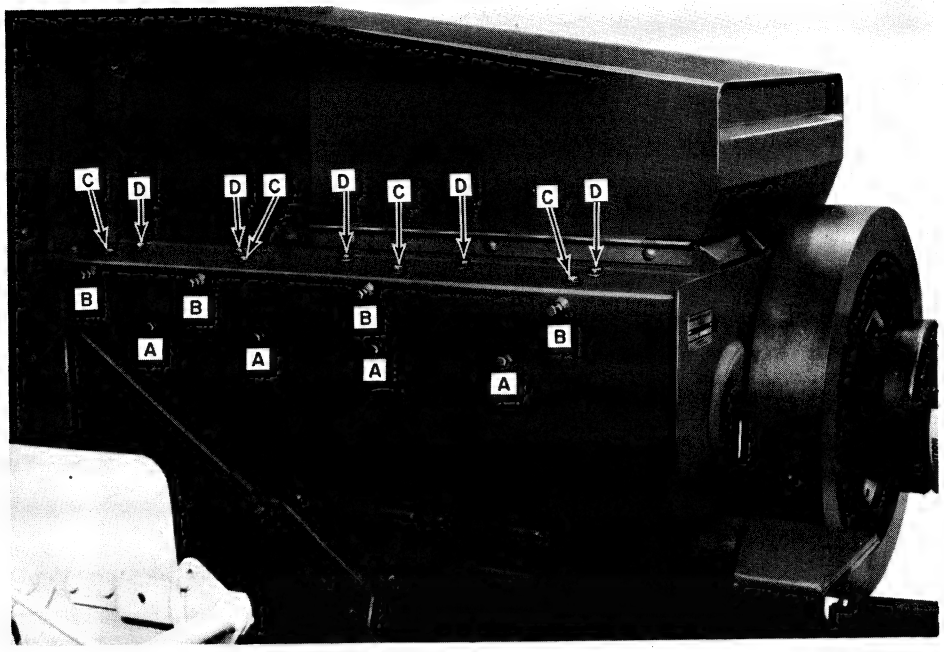


FIGURE 63

12. Install the stationary knife, B, Figure 64. Using a feeler gauge and straight edge as shown in Figure 64, add or remove shims between bale case and knife, B, Figure 64, to obtain .005" to .015" (.1 to .4 mm) as shown.

    Be sure to torque bolt, A, Figure 64, to 75 to 80 ft. lbs. (102 to 109 N·m) before checking the clearance between the straight edge and stationary knife.

13. Adjust bearing, 3, Figure 55, to within .001" to .020" (.02 to .5 mm) of rail, K, Figure 54. Tighten the bearing bolt to 130 to 140 ft. lbs. (176-190 N·m) torque.

14. Adjust bearing, 2, Figure 55, to within .001" to .020" (.02 to .5 mm) of rail, J, Figure 54. Tighten bearing bolt to 130 to 140 ft. lbs. (176 to 190 N·m) torque. Bearing, 2, Figure

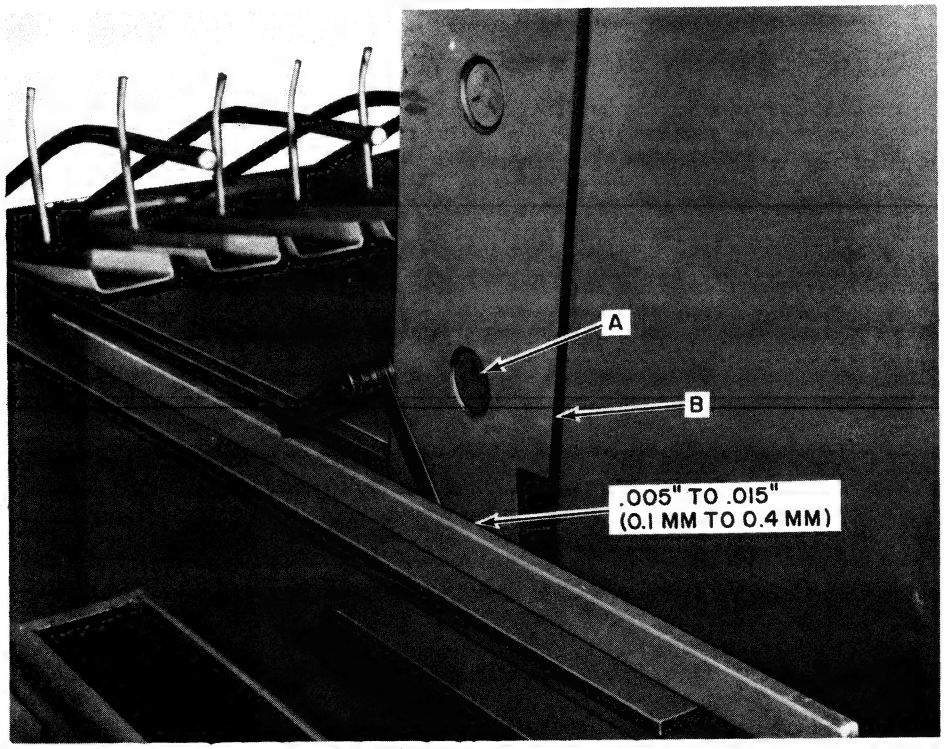


FIGURE 64

55, must clear rail, K, Figure 54, by at least .010" (.3 mm) at any point in bearing travel. Shims are available for rail, J, Figure 54, if not enough clearance exists. Shim rail, J, Figure 54, down and readjust bearing, 2, Figure 55.

15. Adjust plate, A, Figure 65, to obtain 1/16" (1.6 mm) clearance between the plate and the left side of the bale case at the closest point in plunger travel.

CAUTION: NEVER ATTEMPT TO MAKE ANY ADJUSTMENTS WHILE THE MACHINE IS RUNNING.

NEEDLE DRIVE TIMING

Needles, when properly "in time" with the plunger, just begin to enter the bale chamber when the triangular extensions on the plunger face have passed the tips of the needles by ¼"-¾" (6-19 mm). See Figure 66.

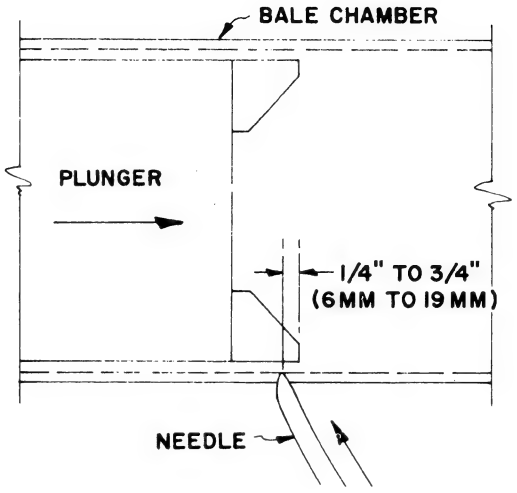


FIGURE 66

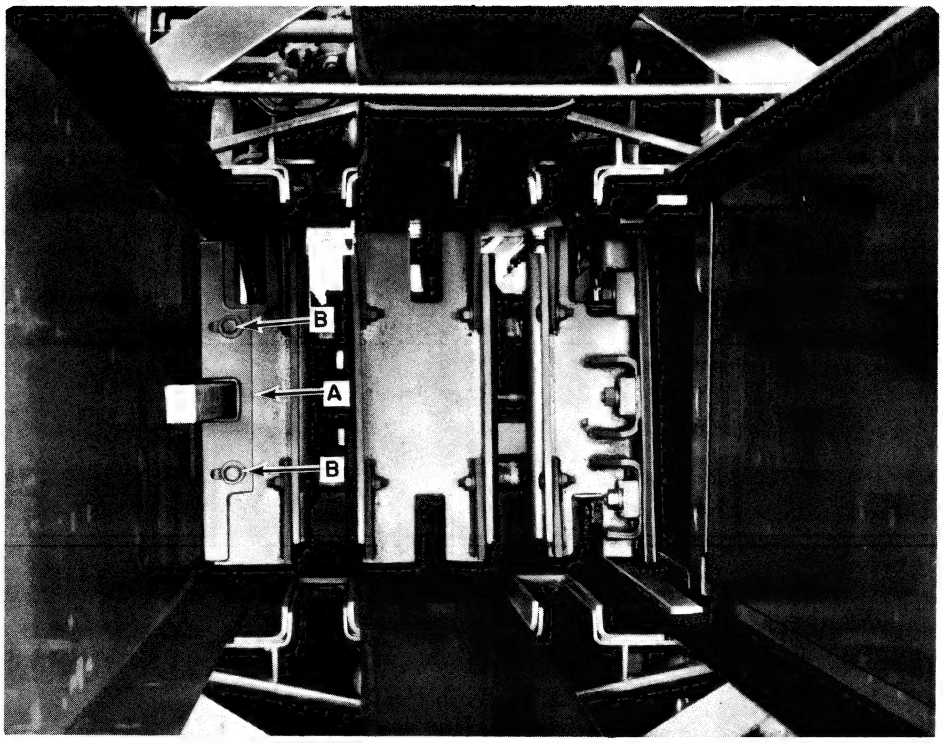


FIGURE 65

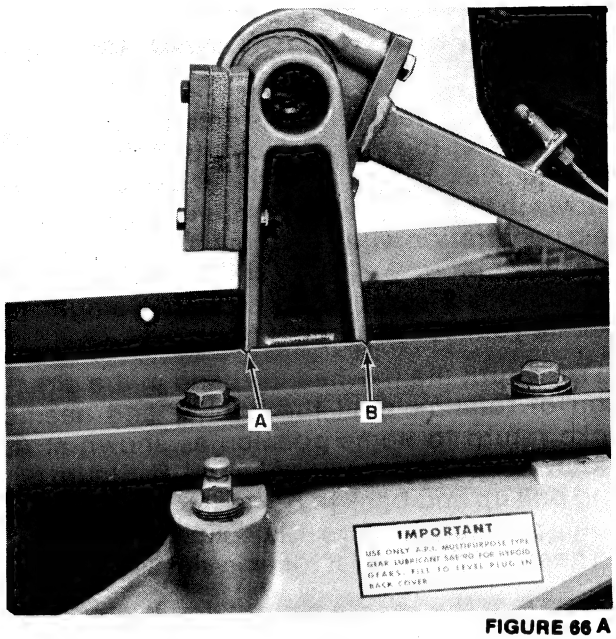


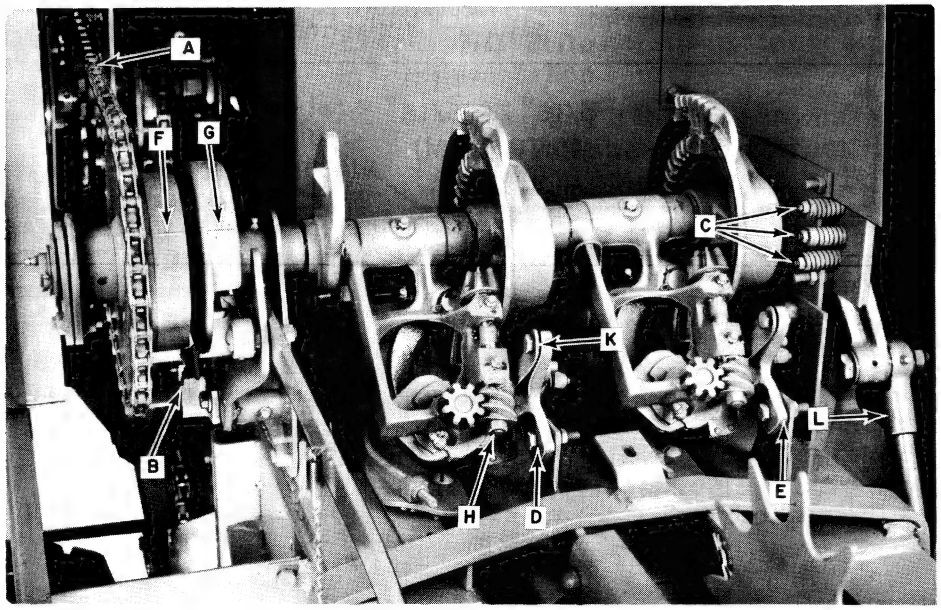
FIGURE 66 A

SHIELDS SHOWN OPEN FOR CLARITY.

This can be checked very easily by means of timing marks provided on the baler. To check, rotate the flywheel in the direction of rotation until the main crank is in the vertical position between marks, A and B, as shown in Figure 66A. Be certain that the knotter clutch pawl is tight against the knotter stop.

At this time, the marks at F and G, Figure 67, should align within ¼" (6 mm). If, for any reason the needles should require "timing", follow this procedure.

1. Remove the knotter/twister drive chain, A, Figure 67.
2. Turn the flywheel in the direction of rotation until the crank is in the vertical position between the timing marks, A and B, Figure 43.
3. Make certain the knotter clutch pawl is against the knotter stop, B, Figure 67, and remove the backlash in the knotter clutch by pulling rearward on the needle yoke rod, L, Figure 67, at the point where it is attached to the knotter arm.
4. Turn the clutch gear until the timing marks on the clutch and the clutch disc are directly opposite each other as shown at F and G, Figure 67.
5. Install the drive chain with the top strand as tight as possible, position the chain tightener, and tighten the drive chain idler securely, keeping the timing marks on the clutch gear and the clutch disc directly opposite each other.
6. Trip the knotter or twister and turn it through a complete cycle to make sure the needles enter the bale chamber at the proper time.



SHIELDS SHOWN REMOVED FOR CLARITY.

FIGURE 67

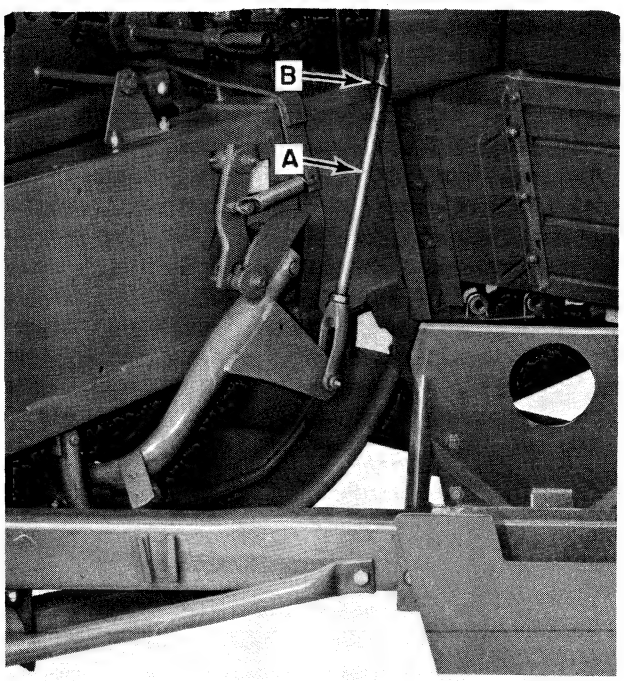


FIGURE 68

NEEDLE PENETRATION AND DETENT ADJUSTMENT

The needle penetration is determined by the clearance at the closest point that the needle yoke comes to the bale chamber angle, as shown in Figure 68, when the needles have correct penetration when this clearance is 3/16" to 5/16" (5 mm to 8 mm) as shown in Figure 56. Obtain this clearance by adjusting length of needle yoke rod, A, Figure 68.

Then turn the flywheel by hand in the direction of rotation until the knotter and needle yoke return to home position as shown at A, Figure 68. Grasp needle yoke rod, B, Figure 68, and pull up and back to be certain knotter is in home position. Be sure roller aligns with detent on needle yoke. Adjust roller in slot as required.

NOTE: If the needle penetration is changed, the adjustment of the needle latch and needle yoke detent must be checked.

NEEDLES AT MAXIMUM PENETRATION

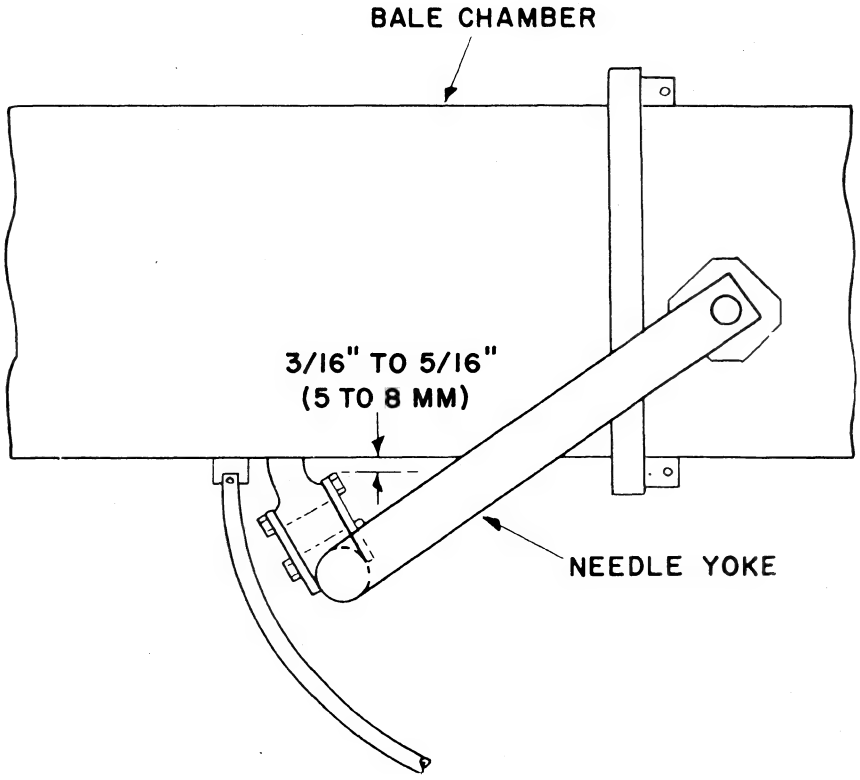


FIGURE 69

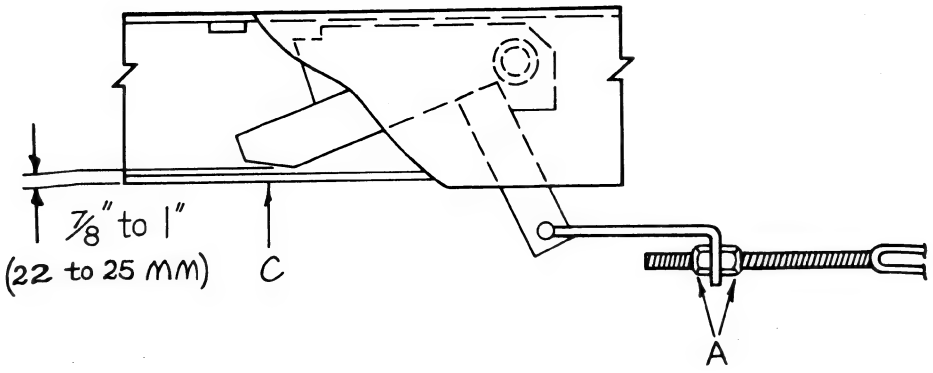


FIGURE 70

NEEDLE LATCH

The needles are protected against breakage by a needle latch which moves in front of the crank arm when the needles enter the bale chamber.

If, for any reason, the needles should remain in the bale chamber when the plunger returns with a charge of hay, the plunger is stopped by the latch engaging the crank arm and the flywheel shear bolt is sheared.

NOTE: If the latch is in the "in" position and interferes with the crank arm, remove it by pulling the needle yoke to the rearmost position NOT by pulling the latch out by itself.

NOTE: Always pull the needle latch out by pulling the needle yoke back to its home position.

Failure to remove the latch in this manner may result in needle breakage.

It is important that the needle latch linkage be properly adjusted to insure that the latch functions properly. When making this adjustment, be sure that the needles are in the home position. The latch may then be adjusted using nuts, A, Figure 70, lengthening or shortening the link so the end of the latch, B, Figure 70, is 7/8"-1" (22-25 mm) inside the edge of the opening at C, Figure 70.

After this adjustment is made, trip the knotters, turn the baler through a tying cycle and recheck the latch adjustment.

The latch should not strike the crank arm when the needles are in the home position.

When the tying mechanism is tripped and starts to rotate, the latch should enter the bale chamber. Then at the point where the tips of the needles are retracted from the bale chamber the latch should be removed from the crank area.

KNOTTER/TWISTER DRIVE SHEAR BOLT

The knotter/twister drive shear bolt, H, Figure 45, protects the knotters or twister, needle yoke and related parts from damage. It is a special bolt supplied with the machine. Additional bolts are available from any authorized Sperry New Holland dealer.

NOTE: Do not attempt to use any other bolt in this location.

When and if this bolt shears, determine the cause for shearing, correct it, rotate the flywheel or sprocket until the bolt holes align and install a new shear bolt.

IMPORTANT: The knotter/twister is driven by a double pawl clutch. Do not rotate the flywheel backward or damage to the knotter/twister will occur.

If it is necessary to turn the flywheel backward, disengage the knotter/clutch pawl and by pulling on the needle yoke, return the knotter/twister to its home position. Engage the pawl and stop before proceeding.

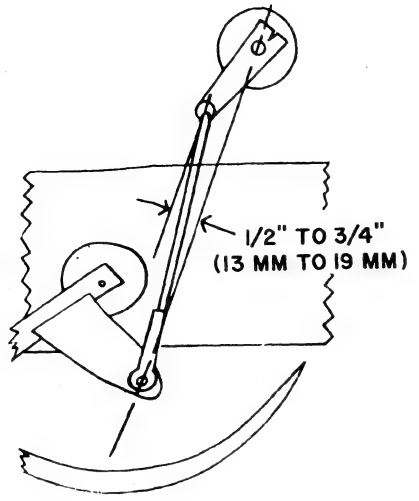


FIGURE 71

KNOTTER/TWISTER STOP

The knotter/twister stop should be adjusted as follows:

a. Rotate the knotter/twister assembly until the needle yoke is ½"-¾" (13-19 mm) past the center line as shown in Figure 71.

CAUTION: DO NOT ATTEMPT TO CLEAN OR ADJUST THE MACHINE WHILE IT IS RUNNING.

b. Place the trip arm in the reset position as shown in Figure 72.

c. Move the cluch pawl, C, Figure 72, as far forward as possible.

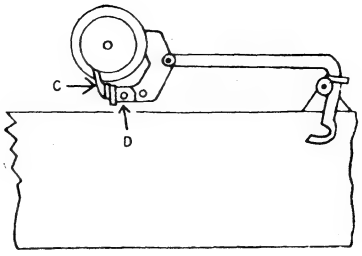


FIGURE 72

d. Adjust the movable leg of the knotter stop, D, Figure 72, until it is tight against the clutch pawl (horizontally).

e. Place the trip arm in the tripped position as shown in Figure 73.

f. Adjust the knotter/twister stop, D, Figure 73, vertically so there is ⅛" (3 mm) clearance between the top of the knotter/twister stop and the bottom edge of the clutch pawl. Be careful while making this adjustment not to change the horizontal adjustment of the stop.

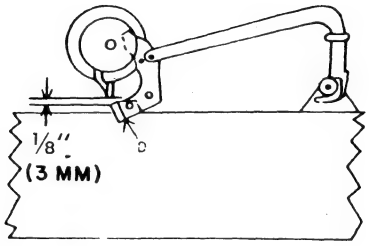
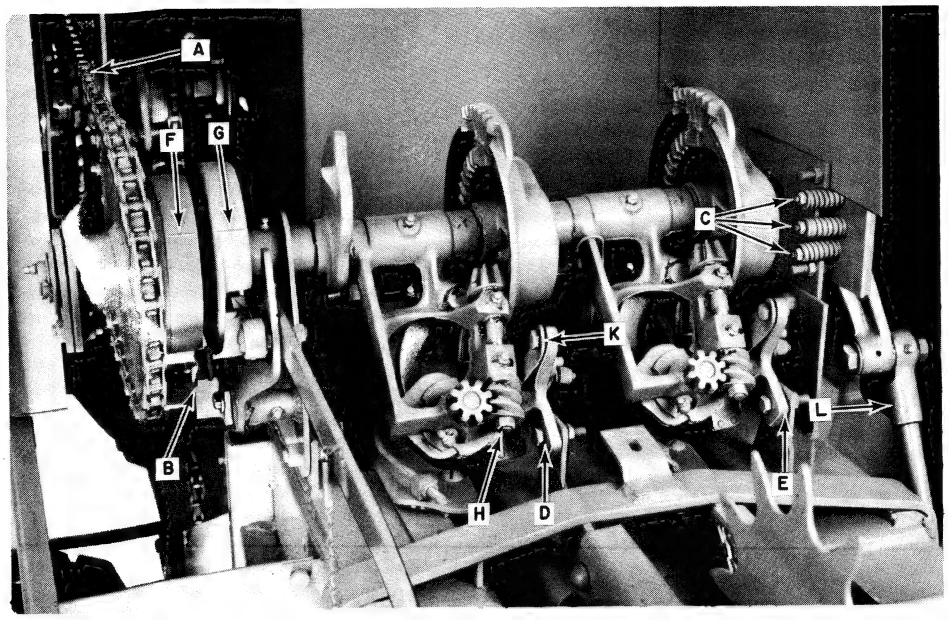


FIGURE 73



SHIELDS SHOWN OPEN FOR CLARITY. **FIGURE 74**

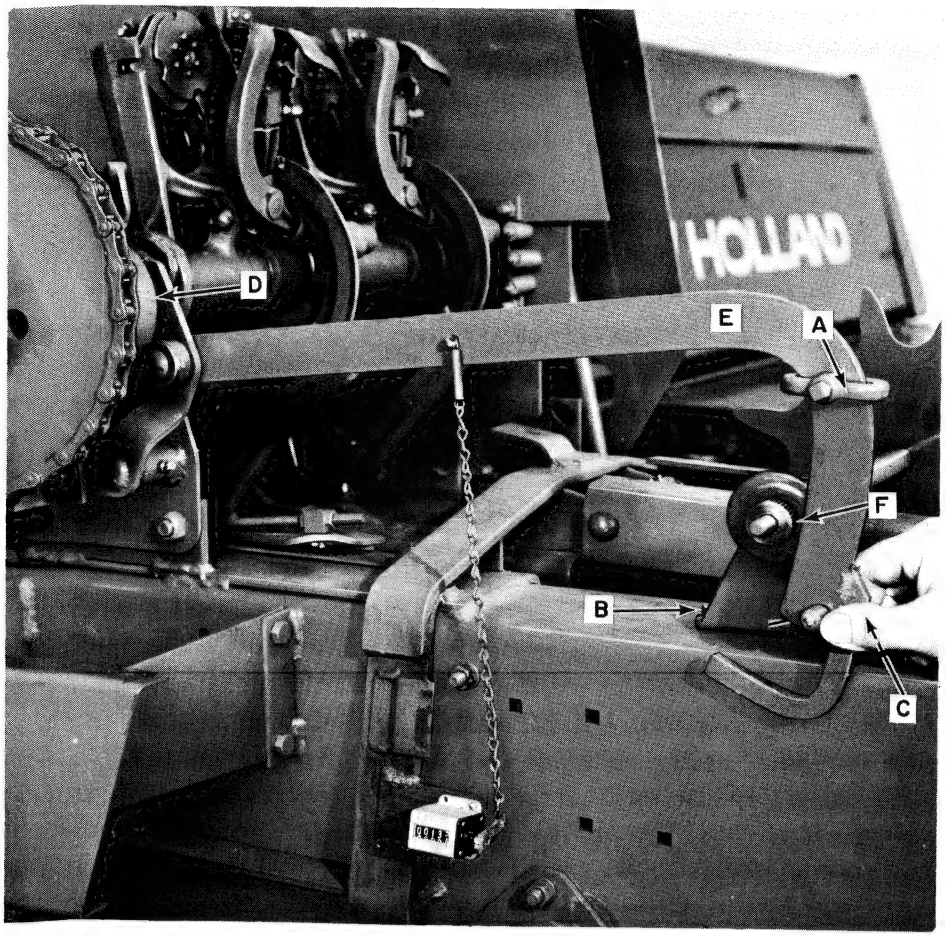
KNOTTER/TWISTER BRAKE

The knotter/twister brake is designed to hold the knotter or twister from drifting out of the home position from the time they are tripped until the time they are driven by the clutch gear. The springs shown at *C*, Figure 74, should be approximately 1¼" (32 mm) long for knotter and 1⅜" (35 mm) long for twister.

If adjusted too tight, excessive knotter or twister drive shear bolt breakage will result.

IMPORTANT: Never grease or lubricate this brake.

If brake is lubricated or if it becomes too loose, excessive flywheel shear bolt breakage will result due to the knotter or twister rotating slightly and allowing the needle latch to enter when it should not.



SHIELDS SHOWN OPEN FOR CLARITY.

FIGURE 75

BALE LENGTH

Bale length is regulated by the metering wheel which is mounted on the bale chamber behind the knotter assembly (Figure 75). As the compressed hay passes through the bale chamber, the metering wheel is turned, the trip arm is raised and the knotter automatically trips.

The length of the bale can be varied from 12"-52" (30-130 cm) simply by moving the set collar, A, Figure 75, up or down on the trip arm. The higher the set collar is located on the trip arm the longer the bale will be, and the lower the collar is placed, the shorter the bale will be.

IMPORTANT: After adjusting bale length be sure to check and adjust the bale counter trip chain.

METERING WHEEL

The metering wheel should be located so when the trip arm, E, Figure 75, is moved to its rearmost position by the cam, D, on the knotter clutch disc, there is ⅛" (3 mm) clearance between the trip arm and the friction disc, as indicated at F, Figure 75. This provides clearance so the trip arm will reset after each knotter cycle and make uniform bales.

To make this adjustment, the following steps should be taken:

1. Trip the knotter.
2. Rotate the knotter assembly until the trip arm reset cam has moved the trip arm to its rearmost position.
3. Loosen bolts, B and C, Figure 75.
4. Move the metering wheel bracket to obtain proper clearance at F, and retighten.
5. Move the right metering wheel bracket to maintain proper alignment of the metering wheel shaft.

BALE WEIGHT (Spring Tension)

The bale weight is determined by the amount of tension applied to the tension rails by means of the tension handles. Turning the handles clockwise increases the tension and consequently the weight of the bales being formed. Turning the handles counter-clockwise decreases the tension and bale weight. Experience will teach the operator the correct adjustment he needs to provide the desired bale weight for his individual baling conditions.

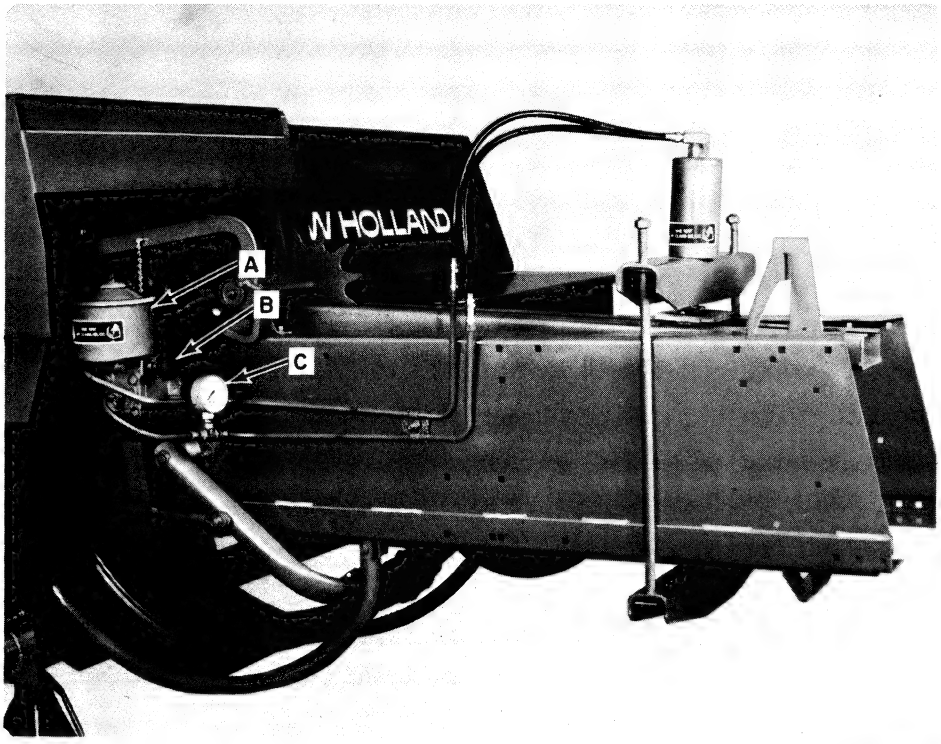


FIGURE 76

BALE WEIGHT (Hydraformatic)

The density of the material in the bale, and consequently the bale weight, is determined by the amount of pressure applied to the tension rails by the hydraulic pump, A, Figure 76.

Turning the relief valve knob, B, Figure 76, clockwise increases the pressure and consequently the bale weight. Turning the knob counter-clockwise decreases the pressure and bale weight.

The gauge, C, Figure 76, indicates the amount of pressure being applied to the tension rails.

IMPORTANT: Attempting to bale too tight may cause tying difficulties.

When starting to bale with a new baler, release the bale tension for the first few bales until the paint is worn off the inside of the bale chamber.

Additional bale weight may be desireable in extremely dry, fluffy materials, such as straw.

This can be obtained by installing additional hay wedges in the bale chamber. These wedges should be installed in pairs directly opposite each other in the bale chamber. THEY MUST BE INSTALLED WITH THE INCLINED PLANE TOWARD THE FRONT OF THE BALER.

BALER MAINTENANCE

MAIN GEARBOX

Use SAE 90 hypoid lubricant, and keep the gearbox filled to the oil level plug.

Change the oil in the gearbox at the beginning of each baling seasion.

KEEP THE GEARBOX MOUNTING BOLTS TIGHT.

Should a problem arise concerning the gearbox, consult an authorized Sperry New Holland dealer.

OPERATORS ARE CAUTIONED NOT TO ATTEMPT TO REPAIR OR ADJUST THE GEARBOX.

TIRES (FLOTATION)

Keep the tires properly inflated. Inflate the right-hand, 27 x 9.5-15 tire to 24 lbs. (165 kPa) pressure and the left-hand, 31 x 13.5-15 tire to 30 lbs. (207 kPa) pressure. Check the tire pressure at least once a week when the baler is in use.

OVERRUNNING CLUTCH

Oil the drive pins of the pick-up overrunning clutch daily with two or three drops of light machine oil. At the beginning of each baling season, disassemble the overrunning clutch assembly and clean and lubricate the pins and bushings.

PTO DRIVE

Keep the PTO drive tube well lubricated so the PTO shaft can telescope freely.

Lubricate the universal joints of the PTO drive carefully with one or two pumps of a hand gun twice a week.

IMPORTANT: Excessive lubrication may damage the grease seals.

DRIVE CHAINS

Keep all drive chains tight at all times, expecially the knotter/twister drive chain. A loose knotter/twister drive chain can cause the needles to get out of time.

Keep the drive chains oiled at all times. Use light motor oil or a mixture of 50% oil and 50% kerosene.

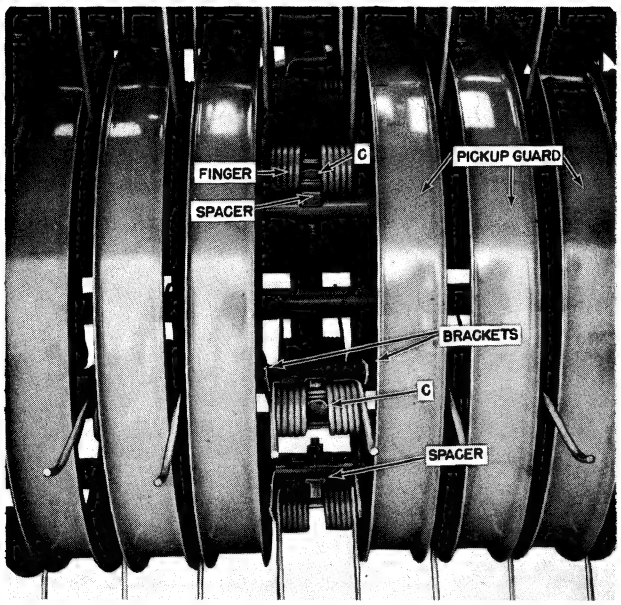


FIGURE 77

SHIELDS SHOWN REMOVED FOR CLARITY.

PICK-UP FINGER

Figure 77 shows the attachment of the pick-up finger to the pick-up tooth pipe on the pick-up.

These pick-up fingers are individually replaceable in the following steps:

1. Remove the four cap screws holding the pick-up guard, and remove the pick-up guard as shown in Figure 77.
2. Remove bolt, C, from the pick-up finger to be removed.
3. Remove the pick-up finger, the two brackets and the spacer.
4. Install the brackets and spacer, as shown in Figure 77, with the new pick-up finger.
5. Install the three parts as a unit with the mounting bolt, C, as shown in Figure 77.

PICK-UP CAM FOLLOWER

A hole is provided in the right pick-up end sheet for easy access to the pick-up cam follower.

To replace a pick-up cam follower, rotate the pick-up until the cam follower is accessible through the opening in the pick-up end sheet. The cam follower may be removed and replaced through this opening, by removing the adjacent guard.

IMPORTANT: When replacing pick-up cam followers, always be certain that the cam follower is trailing the pick-up tooth pipe in the direction of rotation of the pick-up. If the cam follower is leading or going ahead of the pick-up tooth pipe, severe damage may result.

PICK-UP TOOTH PIPE

The pick-up tooth pipe assembly can be removed through the hole provided in the pick-up end sheet as shown at A, Figure 78. To replace a pick-up tooth pipe assembly, remove all the pick-up teeth from the tooth pipe. Remove the cam follower bearing through hole, B, Figure 78. Align the pick-up tooth pipe assembly with the slot in the end sheet. Remove the tooth pipe and install the new pipe assembly.

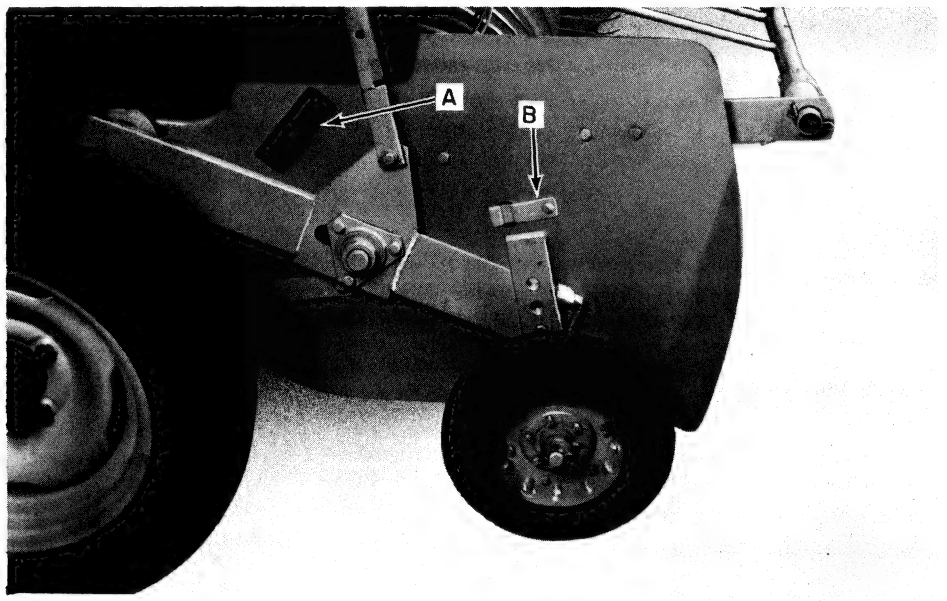


FIGURE 78

CAUTION!

SOME PICTURES IN THIS MANUAL SHOW SAFETY SHIELDS REMOVED OR OPEN TO SHOW PARTS BEING SERVICED OR FOR CLARITY. ALL SHIELDS SHOULD BE CLOSED OR REPLACED PRIOR TO OPERATING THE MACHINE.

CAUTION: THIS SYMBOL IS USED THROUGHOUT THIS BOOK WHENEVER YOUR OWN PERSONAL SAFETY IS INVOLVED. TAKE TIME TO BE CAREFUL!

BALER SERVICE CHART

PROBLEM	POSSIBLE CAUSE	CORRECTION
Shearing flywheel shear bolts.	PTO clutch too tight.	Adjust properly.
	Baling too heavy.	Loosen bale tension.
	Shear bolt nut loose	Tighten shear bolt nut securely.
	Improper needle timing.	Retime the needle drive.
	Needle latch out of adjustment.	Adjust properly.
	Dull knives.	Sharpen knives.
	Excessive clearance between knives.	Adjust knives.
	Pick-up slip clutch too tight.	Adjust properly.
	Worn knotter clutch gear.	Replace.
	Worn or improperly adjusted knotter/twister brake.	Clean and adjust knotter/twister brake, replace worn linings.
Failure to pick up material cleanly.	Pick-up too high from ground.	Raise stop bolt in pick-up lift trap or raise pick-up wheel.
	Too many pick-up fingers bent or broken.	Replace broken and bent pick-up fingers.
	Ground speed too fast.	Slow down.
	Pick-up slip clutch slipping.	Adjust clutch.
Shearing knotter/twister drive bolts.	Dirty knotter or twister.	Clean knotters or twisters.
	Improper adjustment of knotter/twister brake.	Adjust brake.
	Too much end play in knotter/twister stack.	Remove end play in knotter/-twister stack.
	Needle yoke striking bottom of bale chamber.	Adjust needle yoke rod.
Mis-shaped bales. 1. Too much material in left side of bale.	Left feeder tines too far toward left end of tine bar.	Adjust left tines to right until well-shaped bale is produced.
	Irregular feeding of heavy slugs.	Feed more uniformly.
	Position of feeder back.	Move feeder back toward rear.

PROBLEM	POSSIBLE CAUSE	CORRECTION
2. Too much material in right side of bale.	Overfeeding causing tine bar to telescope.	Feed slower, adjust pick-up drive slip clutch.
	Broken feeder tines.	Replace.
	Windrows too large or too small.	Rake uniform and medium sized windrows.
	Pick-up drive slip clutch too tight.	Adjust properly.
	Left feeder tines too far toward the right end of the tine bar.	Adjust left tines to left until well-shaped bale is produced.
	Position of feeder back.	Move feeder back toward front.
Ragged bales.	Feeding too fast.	For optimum bale shape and appearance never attempt to put less than eleven slices per 36" (90 cm) bale.
	Dull knives.	Sharpen knives.
	Improper knife clearance.	Adjust plunger bearings and rails.
Pick-up finger striking ground at all times.	Insufficient tension on pick-up spring.	Tighten pick-up spring.
	Improper adjustment of pick-up guide wheel.	Adjust guide wheel so pick-up teeth clear the ground.
Needle breakage.	Solid objects in needle slots.	Remove the object and clean slots.
	Maladjustment of needles.	Readjust needles.
	Worn knotter clutch gear together with maladjustment of needle latch.	Replace clutch gear.
		Readjust needle latch.
	Needles improperly timed and needle latch not operating.	Retime needle drive and free needle latch.
Irregular bale length.	Metering wheel improperly adjusted.	Adjust.
	Irregular feeding.	Feed uniformly.
	Trip arm badly worn.	Replace worn parts.
Pick-up fingers fail to feed material into feeder area.	Bent and broken teeth.	Replace damaged teeth.

KNOTTER MAINTENANCE AND ADJUSTMENT

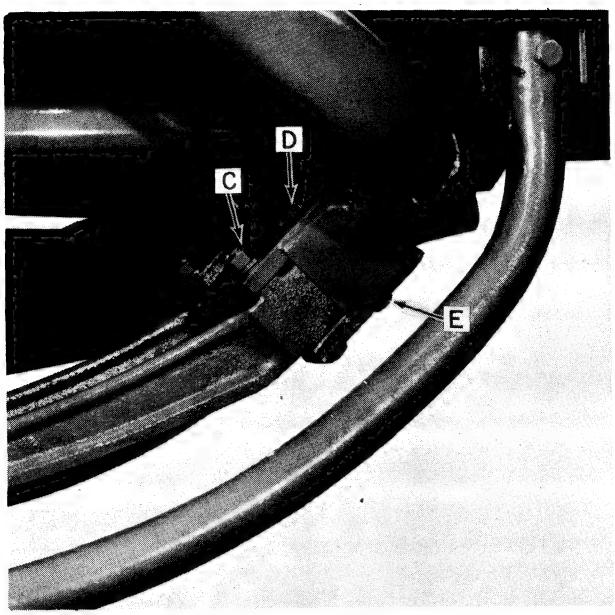


FIGURE 79

NEEDLES

The needles should be adjusted so when they deliver the twine to the knotter, they rub lightly against the knotter frame at A, Figure 80, and clear the twine disc by ⅛" (3 mm) at B, Figure 80.

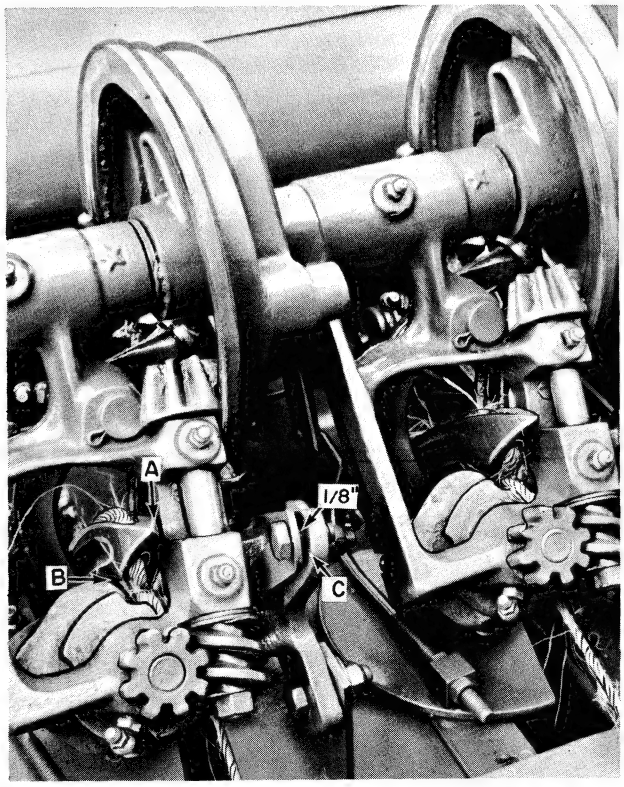
IMPORTANT: Be sure the twine disc contains twine before attempting to adjust needles.

Needles are adjusted to rub lightly on the knotter frames by loosening bolt, C, Figure 79.

Clearance between the needle and twine disc is INCREASED by LOOSENING cap screw, E, and TIGHTENING cap screw, D. This clearance is decreased by loosening cap screw, D, and tightening cap screw, E, Figure 79.

IMPORTANT: The knotter/twister is driven by a double pawl clutch. Do not rotate the flywheel backward or damage to the knotter/twister will occur.

If it is necessary to turn the flywheel backward, disengage the knotter/twister clutch pawl and by pulling on the needle yoke, return the knotter/twister to its home position. engage the pawl and stop before proceeding.



SHIELDS SHOWN OPEN FOR CLARITY.

FIGURE 80

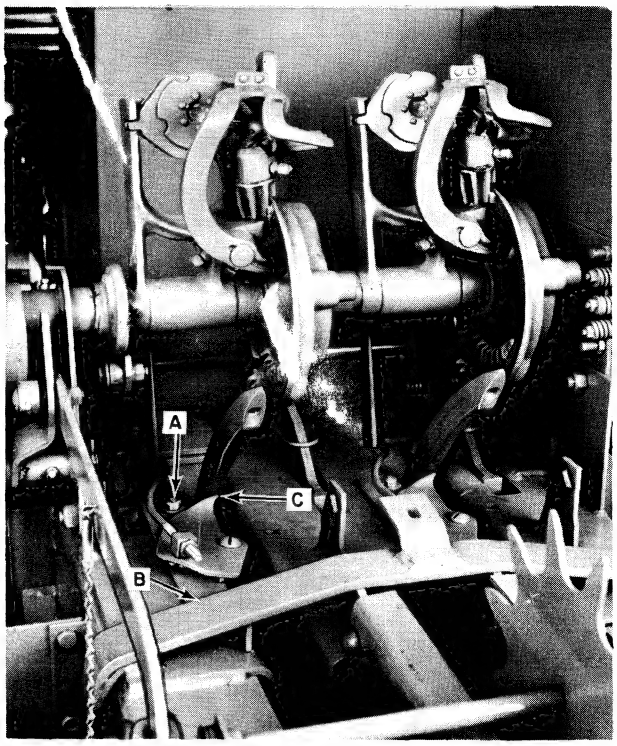


FIGURE 81

SHIELDS SHOWN OPEN FOR CLARITY.

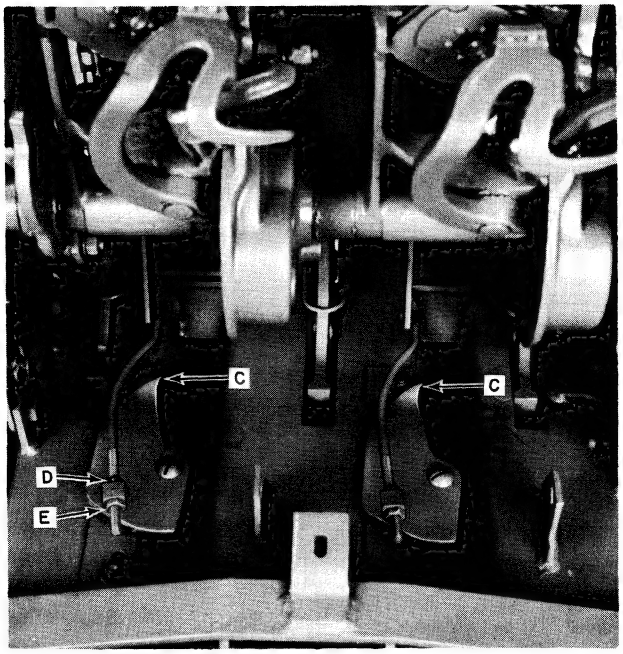


FIGURE 82

SHIELDS SHOWN OPEN FOR CLARITY.

TWINE FINGER

To adjust the twine finger properly, trip the knotters and rotate until the point of the twine finger is just passing the inner radius of the needle, see Figure 81. At this position, loosen bolts, A and B, Figure 81, and move the twine finger forward or back so there is 1/32" (0.8 mm) clearance at C, between the tip of the twine finger and needle.

Rotate the knotters until they are in their home position. Adjust nuts, D and E, Figure 82, so the tip of the twine finger, C, is even with the edge of the needle slot in the top of the bale chamber.

NOTE: The needle and twine finger adjustments should always be made in the order outlined.

SERVICING THE KNOTTER STACK

The diagrams, Figures 83 and 84, are drawings of the knotter assembly. Should it become necessary to disassemble the knotter, it should be restacked exactly as shown to obtain the dimensions shown.

Be sure to install only one ⅛" (3 mm) washer at A and B, Figures 83 and 84, between the inside surface of the cam gears and the knotter frames. It is important that the two washers, A and B, do not bind so the flat surfaces of the cam gears can be adjusted snugly to the knotter frames at C and D, Figures 83 and 84.

IMPORTANT: Be sure to check the baler serial number when servicing the knotter stack. Refer to the proper drawing for correct dimensions.

KNOTTER STACK END PLAY

Excessive end play in the knotter stack will accelerate wear and if not corrected can result in breakage of knotter parts.

320 KNOTTER STACK S/N 420423 AND BELOW

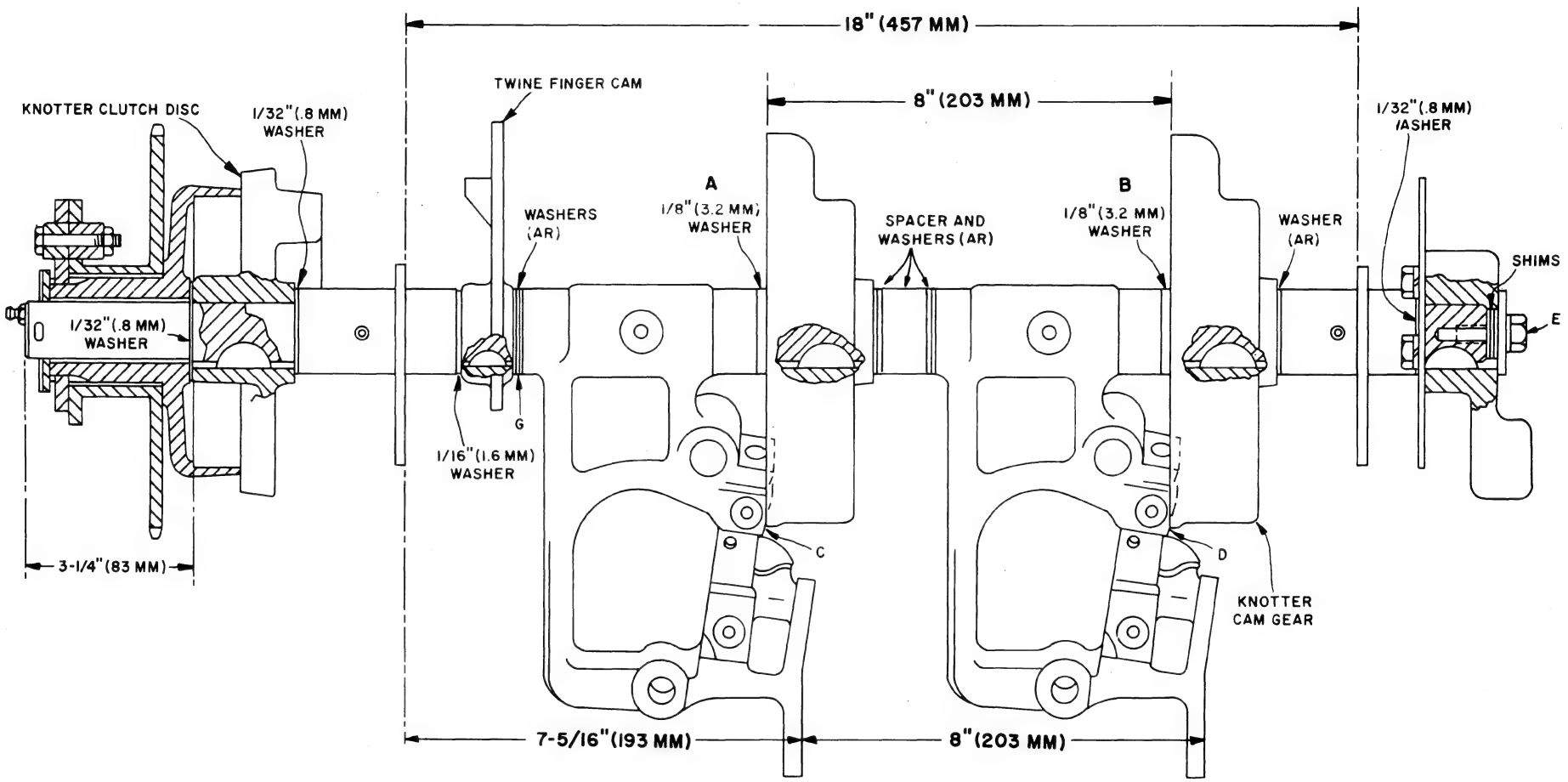
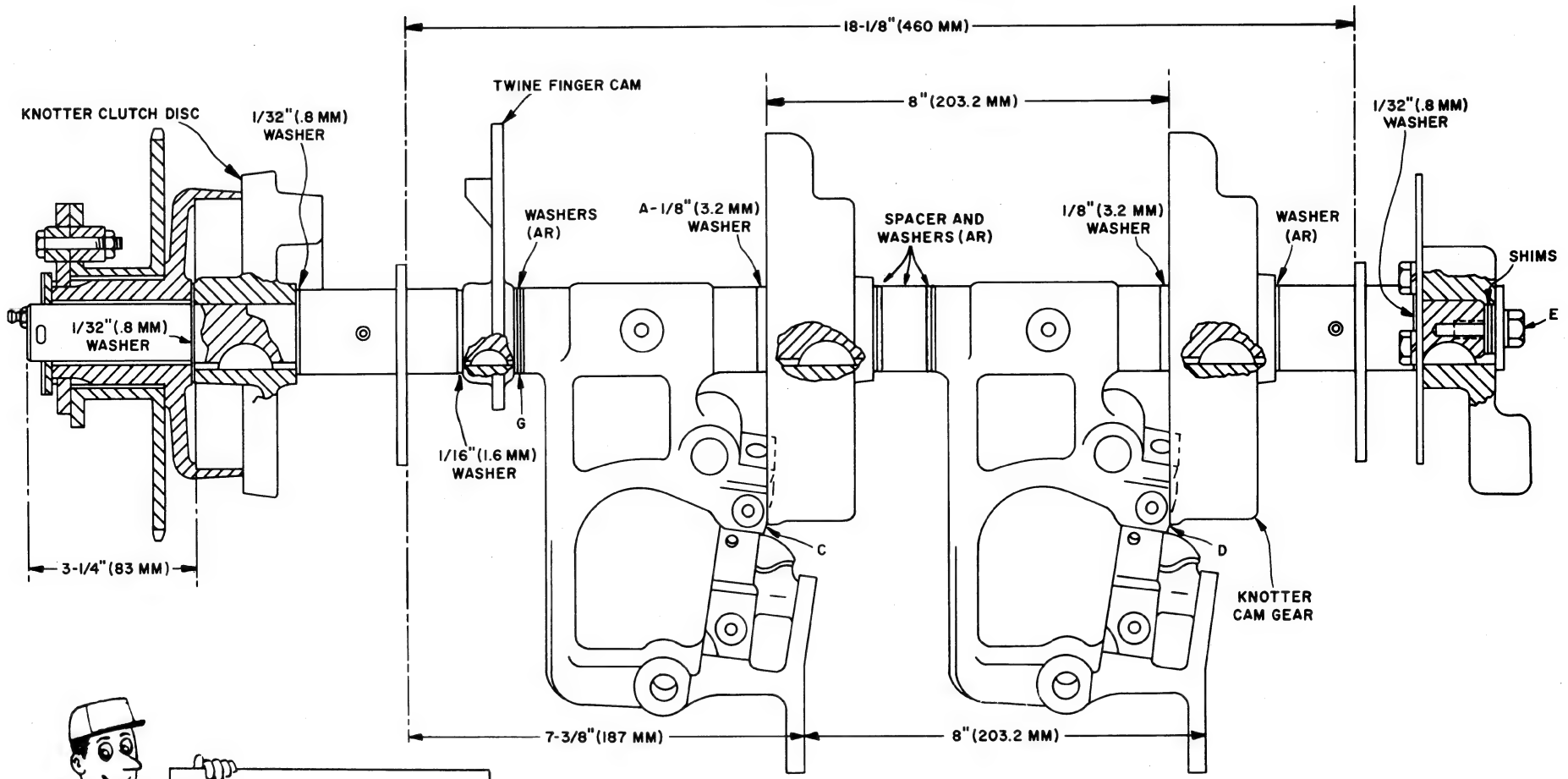
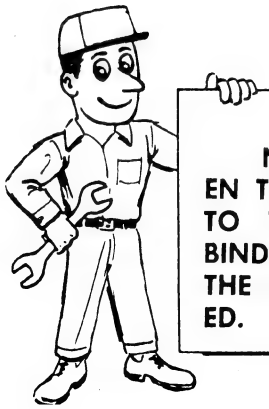


FIGURE 83

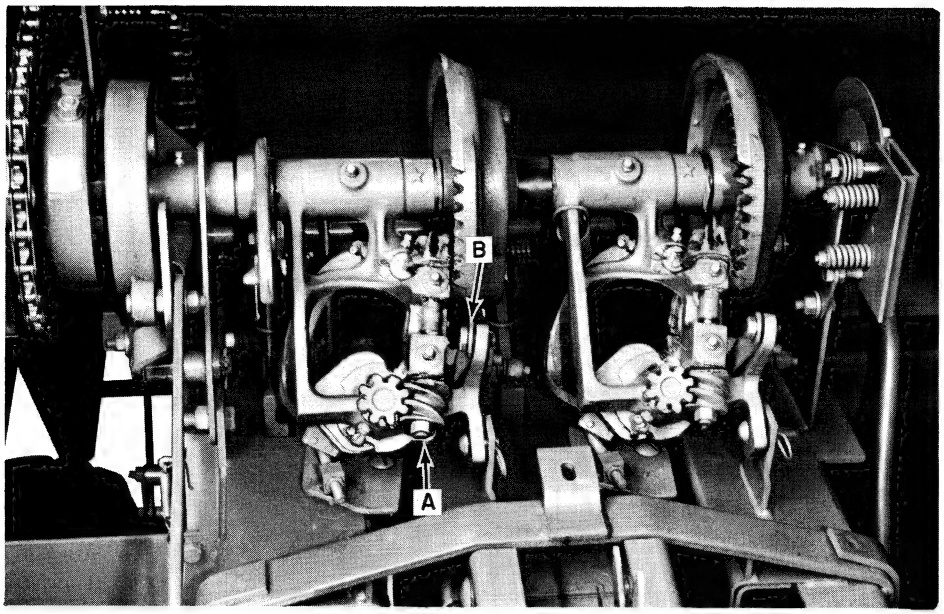
320 KNOTTER STACK
S/N 420424 TO S/N 520823





NOTE: NEVER TIGHTEN THE KNOTTER STACK TO THE EXTENT THAT BINDING OCCURS WHEN THE KNOTTER IS ROTATED.

FIGURE 84



SHIELDS SHOWN OPEN FOR CLARITY.

FIGURE 85

When the cam gears can be moved sideways on the knotter shaft, end play should be adjusted. Loosen clamp bolt on knotter arm and remove cap screw, E, Figure 83, from end of knotter shaft and remove the required shims from under cap screw to eliminate any clearance between the cam faces and knotter frames at C and D, Figures 83 and 84. Tighten clamp bolt and knotter arm.

TWINE DISC TIMING

The twine disc is shown in Figure 86. It must be timed to the twine holder so the leading edge of the notch is past A, on the twine holder ⅛" (3 mm) when the twine disc contains twine as shown in Figure 86.

To adjust the disc to this position, loosen nut, H, Figure 85, several turns. Tap the nut end of the shaft and turn the disc to the setting of the notch shown in Figure 86.

After the twine disc is positioned properly, tap the pinion end of the shaft to move it back to its original position. Turn the worm gear so it will fit against the space washers; then turn the lock nut tight.

TWINE HOLDER

The twine holder, shown in Figure 86, is a double plate which holds the twine in the twine disc. The holder is retained in position by a flat spring with adjustable tension screw, B, Figure 85. The twine holder tension spring exerts pressure against the twine holder, which in turn holds the twine in the disc under pressure.

The tension spring must be adjusted according to the weight and density of the bales that are produced. When the weight of the bale is increased, the adjusting screw on the twine holder tension spring must be adjusted accordingly. A starting point for the tension spring would be a gap of ⅛" (3 mm) between the tension spring and the frame of the knotter as shown in C, Figure 80.

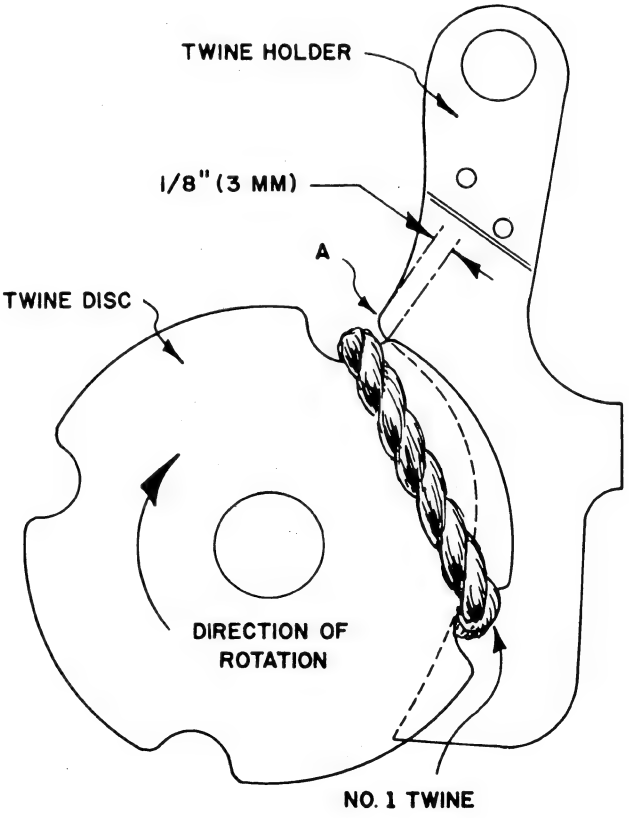


FIGURE 86

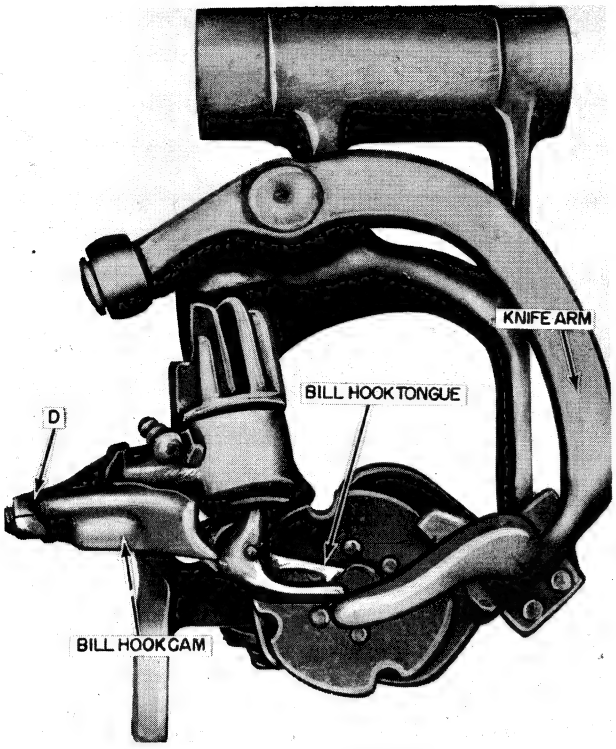


FIGURE 87

BILL HOOK

Proper adjustment of the bill hook is very important because it is here that knots are formed.

Tension on the bill hook tongue is adjusted by means of adjusting nut, D, Figure 87. Usually this nut can be tightened until two or three threads of the bolt show out past the nut. If this nut is too tight, knots will occasionally hang on the bill hook after they are formed. If it is too loose, the ends will not be pulled completely through the knot. Excessive tension on spring may also contribute to wearing flat spots on bill hook tongue roller.

If the bill hook tongue is bent, there is a possibility the bill hook may not catch both strands of twine. The back of the tongue should be straight, not curved. Rough edges and fins on any parts of the bill hook will cause the knots to cling to the bill hook. All these rough edges should be removed with a file, then thoroughly smoothed with emery cloth.

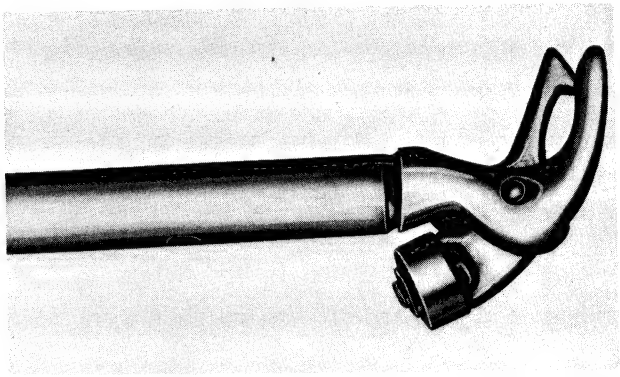


FIGURE 88

Figure 88 shows a closed bill hook with the proper amount of space between the bill hook jaw and bill hook tongue. A bill hook of this type will hold the ends of twine securely while the loop is drawn tight over the ends of the twine to form a good knot.

KNIFE ARM

The knife arm should be adjusted so the bill hook will revolve without contacting any surface of the knife arm assembly as shown in Figure 89.

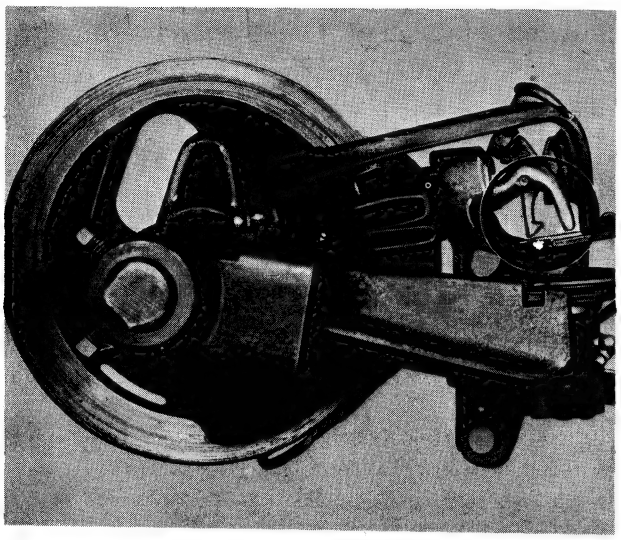


FIGURE 89

The half-moon shaped knife arm stripper flange should rub against the heel of the bill hook when the knife arm operates as illustrated at A, Figure 90. When set in this position, this flange will push the knot loop off the bill hook while the bill hook jaw holds the two ends, and a good knot will be formed.

When the half-moon shaped stripper flange does not rub against the bill hook heel it will pass by the twine as shown in Figure 91, and, as a result, the knot will not be removed from the bill hook.

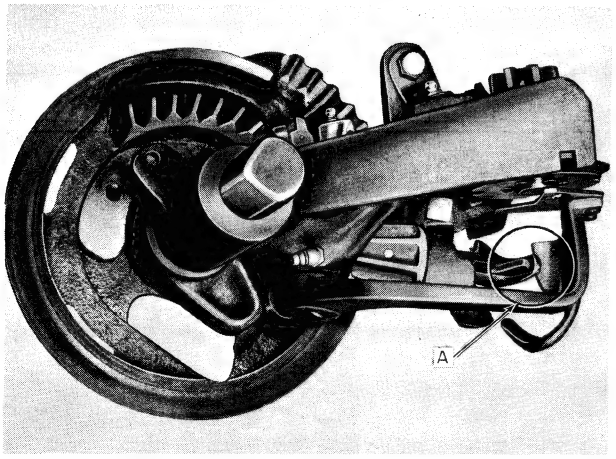


FIGURE 90

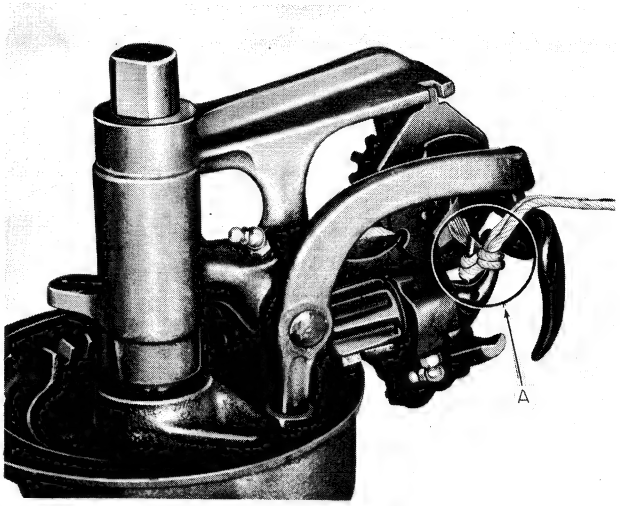


FIGURE 91

Knots may also hang on the bill hook if the knife arm has insufficient lift. When adjusted properly, the stripper flange of the knife arm will clear the end of the bill hook by not less than ⅜" (9 mm) and not more than ½" (13 mm) when the knife arm is at its farthest point of movement by the cam on the cam gear.

To determine when knife arm adjustment is necessary, trip the knotter mechanism and turn the flywheel manually to run the knotter one complete cycle. By watching the knife arm operation, see if any of the above mentioned knife arm maladjustments can be noted. If maladjustments are noticed, or if there is any reasonable doubt, remove the knotter mounting bolt and swing the knotter assembly up from its regular position. By doing this, a closer inspection can be made of the knife arm setting.

If it appears that a slight arm adjustment is necessary, it may be possible to bend the knife arm with a hammer or pry bar without removing any parts of the knotter.

Figure 92 shows the type of knot formed by a properly adjusted knotter.

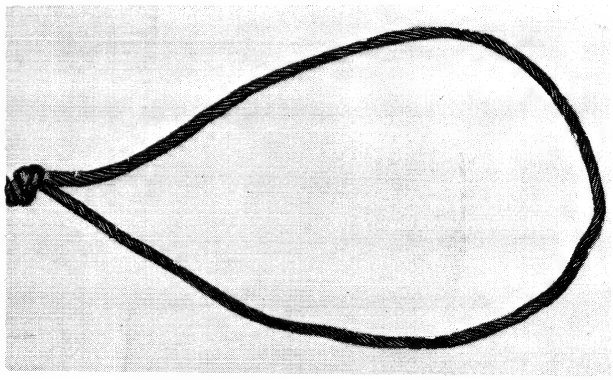
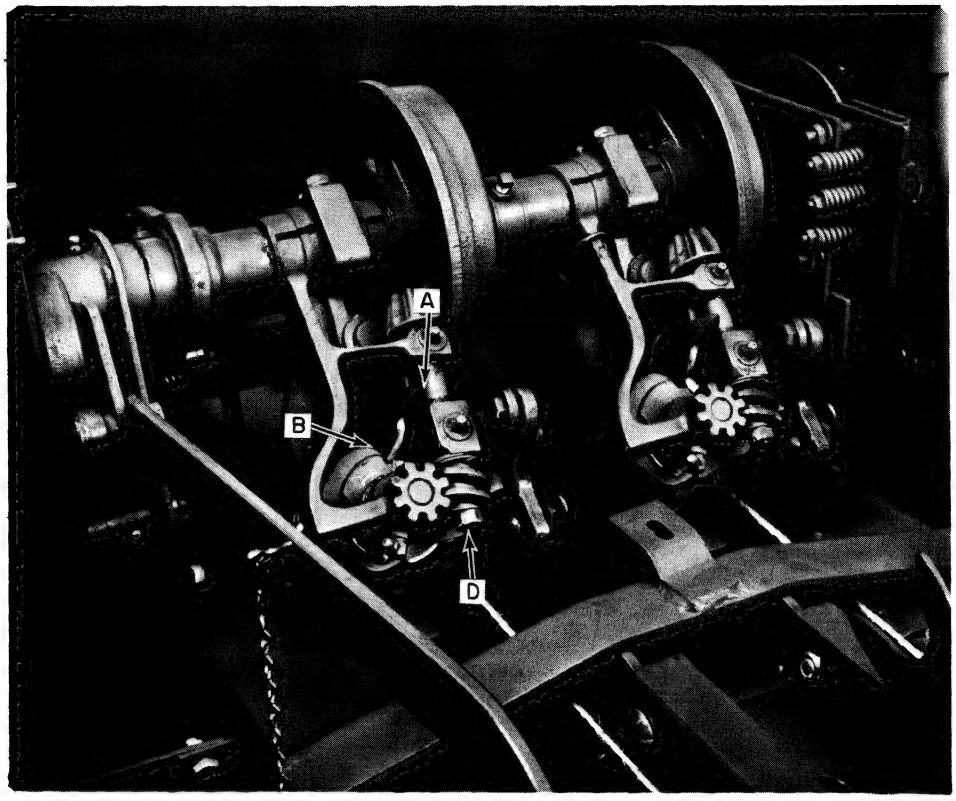


FIGURE 92

HEAVY DUTY KNOTTER MAINTENANCE AND ADJUSTMENT



SHIELDS SHOWN OPEN FOR CLARITY.

FIGURE 93

The operation of the heavy duty knotter, Figure 93, is exactly the same as the standard knotter. The adjustments and dimensions used are the same as the standard knotter.

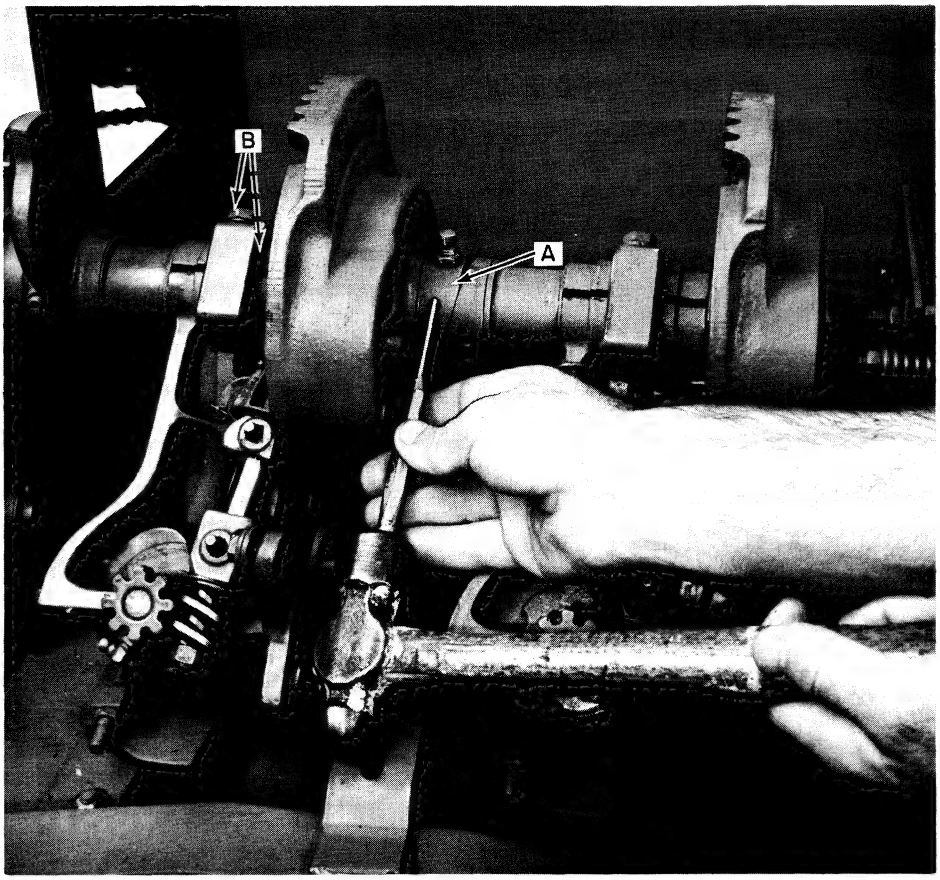
IMPORTANT: The knotter/twister is driven by a double pawl clutch. Do not rotate the flywheel backward or damage to the knotter/twister will occur.

If it is necessary to turn the flywheel backward, disengage the knotter/twister clutch pawl and by pulling on the needle yoke, return the knotter/twister to its home position. Engage the pawl and stop before proceeding.

KNOTTER FRAME ASSEMBLY

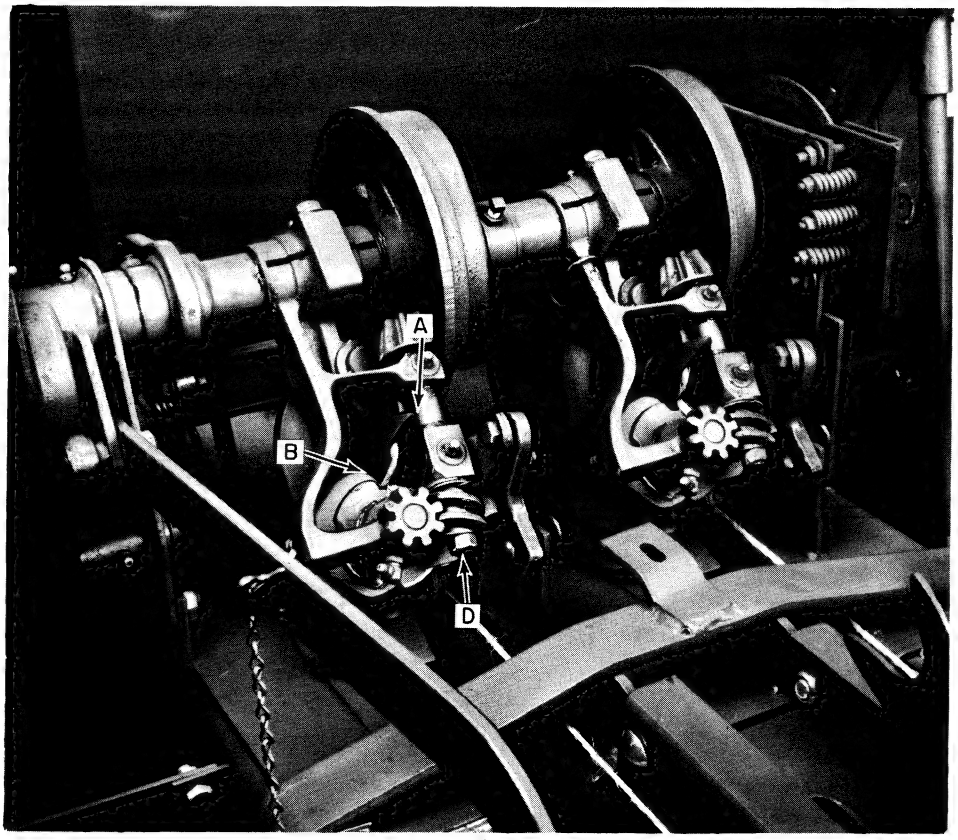
The knotter frame assembly can be removed from the knotter shaft assembly without disassembling all the components from one end of the stack. This is done by loosening the jam nut and set screw in the adjusting collar, A, Figure 94. Rotate the collar so there is clearance between the adjusting collar and the cam gear. Tap the cam gear away from the knotter frame assembly. Remove cap screws, B, Figure 94, from the frame assembly and the hub will be in two pieces. Remove hairpin cotter, A, and pin, B, Figure 93. The frame assembly can now be removed from the shaft.

IMPORTANT: The top half of the frame must be mounted to the bottom half in the same relationship that it had been originally installed. The top half is not interchangeable with other frames.



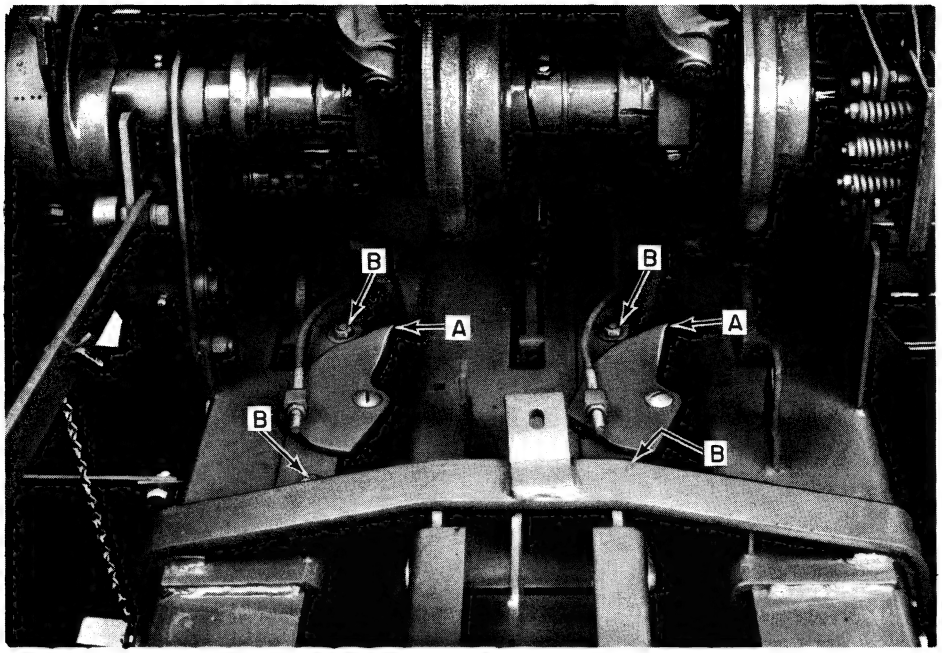
SHIELDS SHOWN REMOVED FOR CLARITY.

FIGURE 94



SHIELDS SHOWN REMOVED FOR CLARITY.

FIGURE 95



SHIELDS SHOWN REMOVED FOR CLARITY.

FIGURE 96

NEEDLES

The needles should be adjusted so when they deliver the twine to the knotter, they rub lightly against the knotter frame at A, Figure 95, and clear the twine disc ⅛" (3 mm) at B, Figure 94.

IMPORTANT: Be sure that the twine disc contains twine before attempting to adjust the needles.

Needles are adjusted to rub lightly on the knotter frames by loosening the bolts, C and D, Figure 79.

Move the needle sideways to its proper location and tighten bolts.

Clearance between the needle and twine disc is increased BY LOOSENING bolt, C, and TIGHTENING bolt, D. This clearance is decreased by loosening bolt, D, and tightening bolt, E, Figure 79.

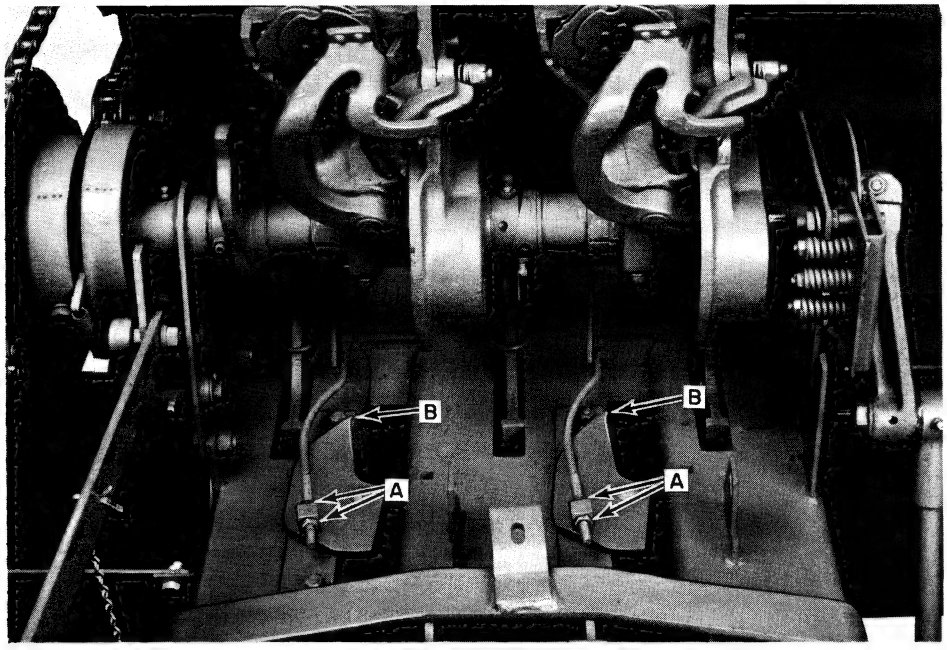


FIGURE 97

SHIELDS SHOWN REMOVED FOR CLARITY.

TWINE FINGER

To adjust the twine finger properly, trip the knotters and rotate the flywheel in the direction of rotation, until the point of the twine finger is just passing the inner radius of the needle, see Figure 96. At this position, loosen bolts, B, Figure 96, and move the twine finger forward or backward so there is 1/32" (0.8 mm) clearance at A, between the tip of the twine finger and the needle.

Rotate the knotters until they are in the home position. Adjust nuts, A, Figure 97, so the tip of the twine finger, B, is even with the edge of the needle slot in the top of the bale chamber.

NOTE: The needle and twine finger adjustments should always be made in the order outlined.

SERVICING THE KNOTTER STACK

The diagrams, Figures 98 and 99, are sketches of the knotter stack. Should it be necessary to disassemble the knotter stack, it should be stacked exactly as shown to obtain the correct dimensions. Be sure to install the space washers in the correct position.

IMPORTANT: Be sure to check the baler serial number.

Use Figure 98 for serial number 520824 up to and including serial number 571010.

Use Figure 99 for serial number 571011 and above.

USED ON SERIAL NUMBERS 520824 THROUGH 571010

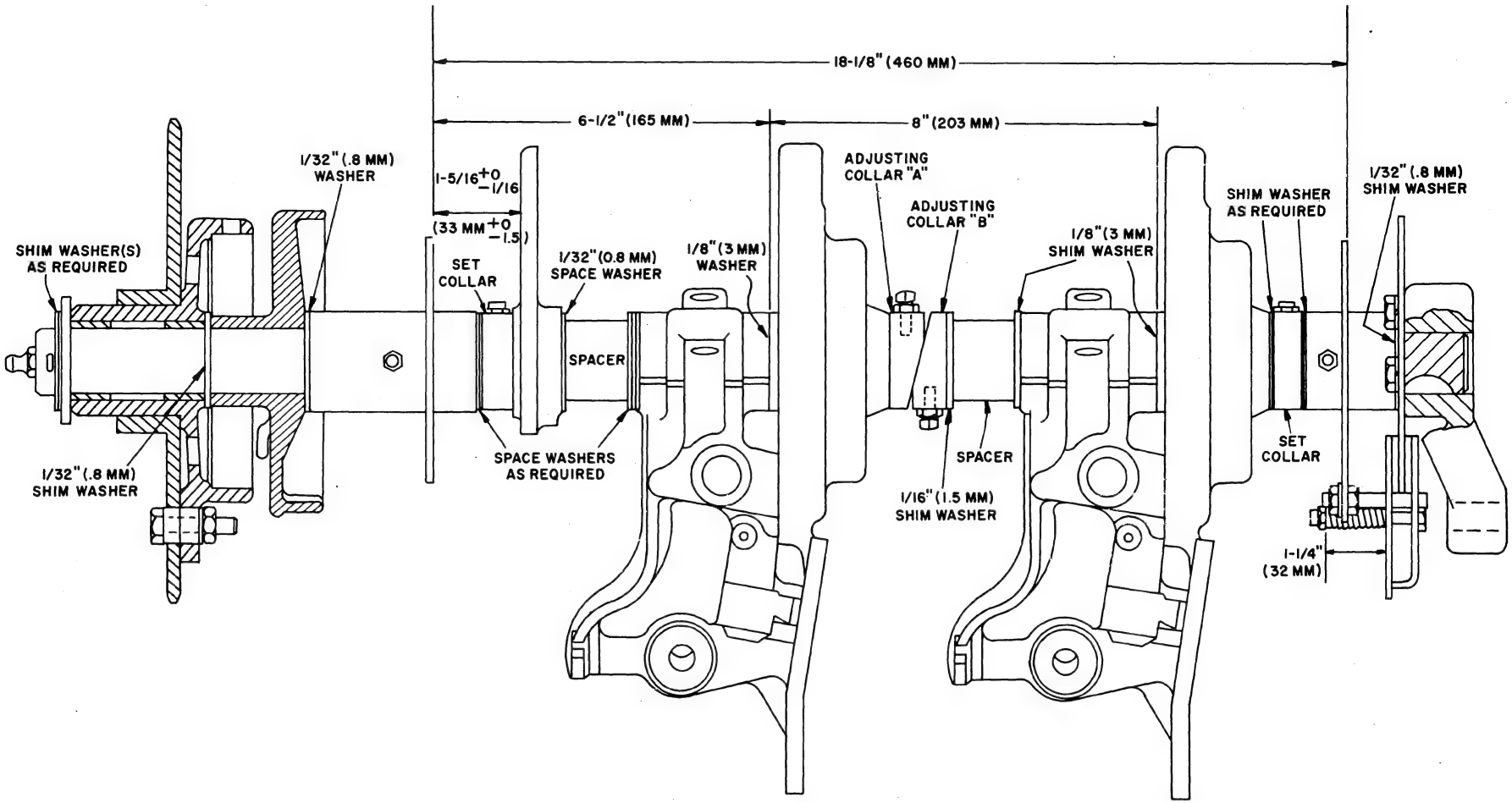
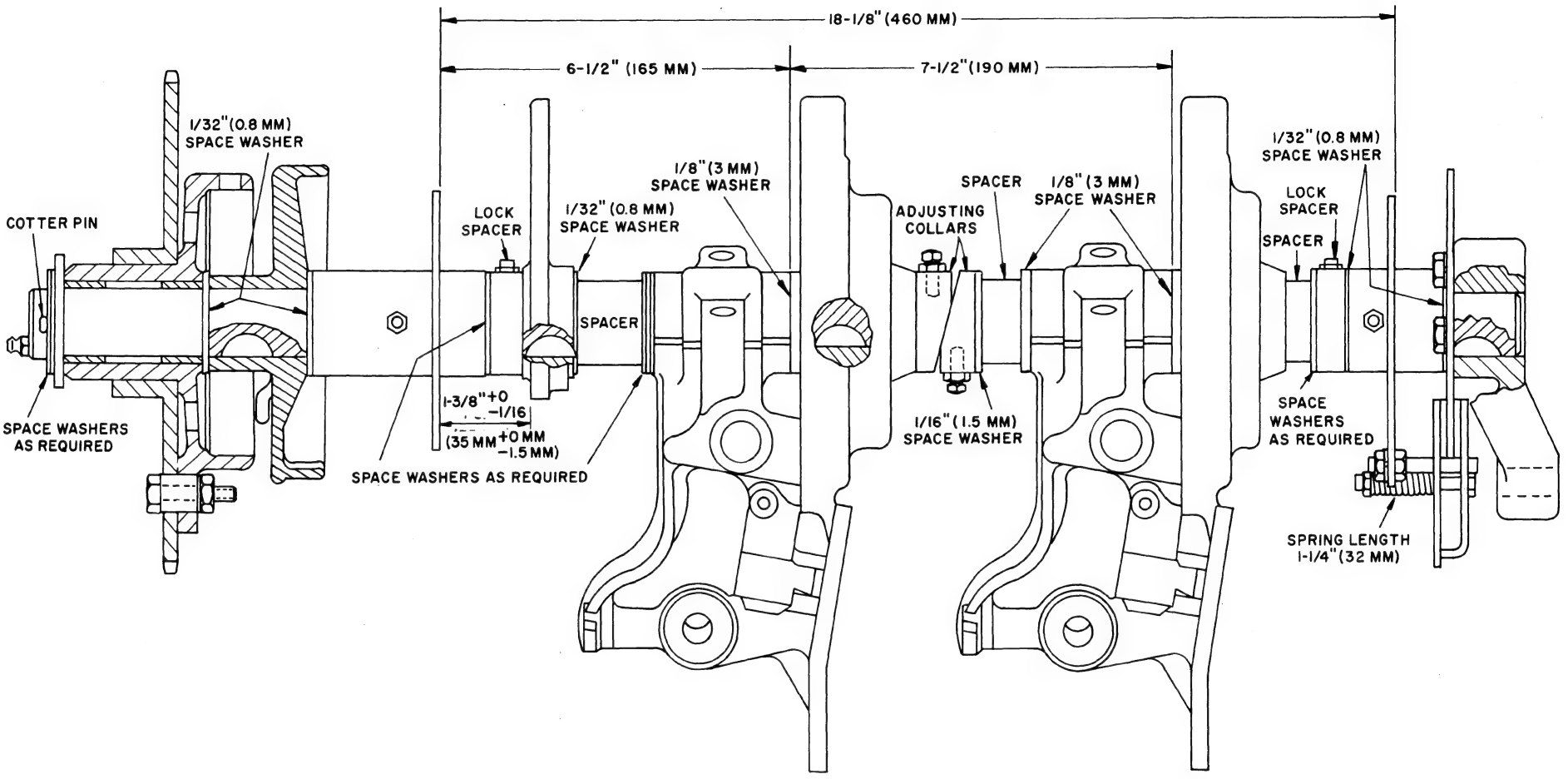


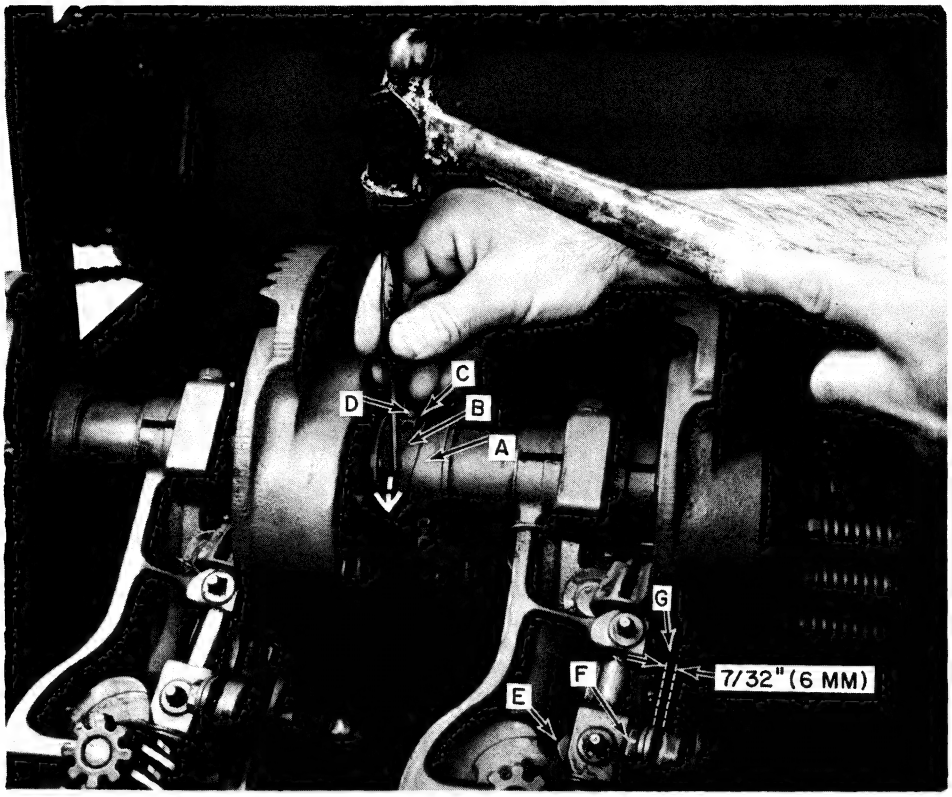
FIGURE 98

USED ON AND ABOVE SERIAL NUMBER 571011



99

FIGURE 99



SHIELDS SHOWN REMOVED FOR CLARITY. **FIGURE 100**

KNOTTER STACK ENDPLAY

Excessive endplay in the knotter stack will accelerate wear, and if not corrected, can result in breakage of knotter parts. Two cams, A and B, shown in Figure 100, control the endplay in the knotter stack.

When the cam gears can be moved sideways on the knotter stack, endplay should be adjusted.

To remove the endplay in the left knotter cam gear, loosen jam nut, C, Figure 100, and set screw, D, Figure 100. Using a hammer and punch, tap the punch lightly to rotate the left cam in the direction indicated. When the cam gear is properly set to the bill hook pinion or twine disc pinion, a force of 5-7 lbs. (22-31 N) is required to raise the knotter from the rest position up to the position where the knife arm lobe is engaged. Tighten the set screw and jam nut in the adjusting collar to maintain that setting.

To adjust the endplay in the right knotter, follow the same procedure utilizing the right-hand cam.

TWINE DISC ADJUSTMENT

The twine disc is shown in Figure 86. It must be timed to the twine holder so the leading edge of notch is located at A, on the twine holder ⅛" (3 mm) when the disc contains twine as shown in Figure 86.

To adjust the disc to this position, loosen nut, D, Figure 95, several turns. Tap the nut end of the shaft to free the worm from the shaft. Turn the disc to the setting shown in Figure 86.

After the twine disc is positioned properly, tap the pinion end of the shaft moving back to its original position. Turn the worm gear so it will fit against the spacer washers and tighten the nut.

TWINE HOLDER

The twine holder shown at E, Figure 100, is a triple plate which holds the twine in the twine disc. The holder is retained in position by two flat springs with an adjustable tension screw, F, Figure 100. The twine holder tension springs exert pressure against the twine holder, which in turn holds the twine and disc under pressure.

The tension springs must be ajdusted according to the weight and density of the bales that are produced. When the weight of the bale is increased, the adjusting screw on the twine holder tension springs must be adjusted accordingly. A starting point for the tension spring is a gap of 7/32" (6 mm) between the tension spring and the frame of the knotter as shown at G, Figure 100.

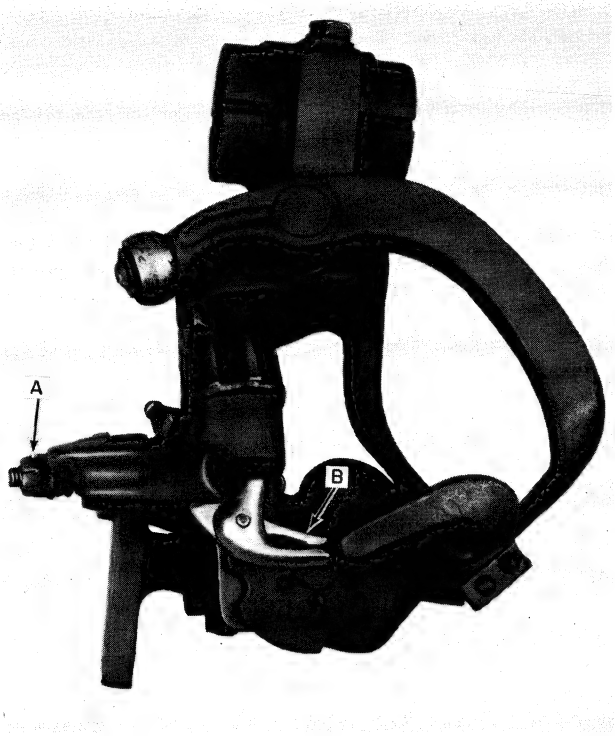


FIGURE 101

BILL HOOK

Proper adjustment of the bill hook is very important. It is here that the knots are formed.

Tension on the bill hook tongue is adjusted by means of adjusting nut, A, Figure 101. A starting point for the spring length is 11/16" (18 mm). If this nut is too tight, knots will occasionally hang on the bill hook. If it is too loose, the ends will not be pulled completely through the knot forming a bow knot. Excessive tension on the spring may also contribute to wearing flat spots on the bill hook and roller.

If, for any reason, bill hook tongue, B, Figure 101, is bent, there is a possibility the bill hook may not catch both strands of twine. The back of the tongue should be straight, not curved. Rough edges and fins on any part of the bill hook will cause the knots to cling to the bill hook. All of these rough edges should be removed with a file and thoroughly smooothed with emery cloth.

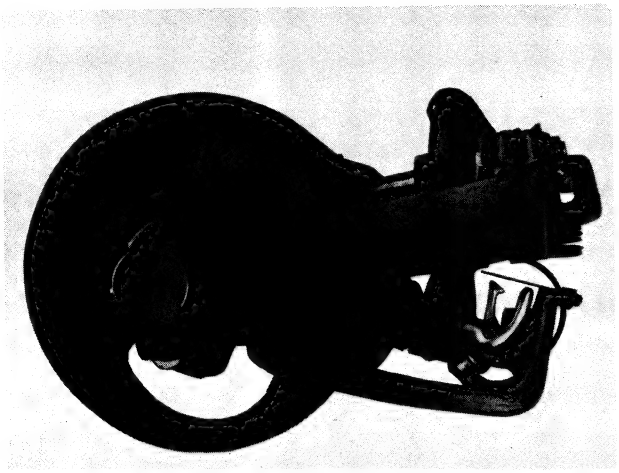


FIGURE 102

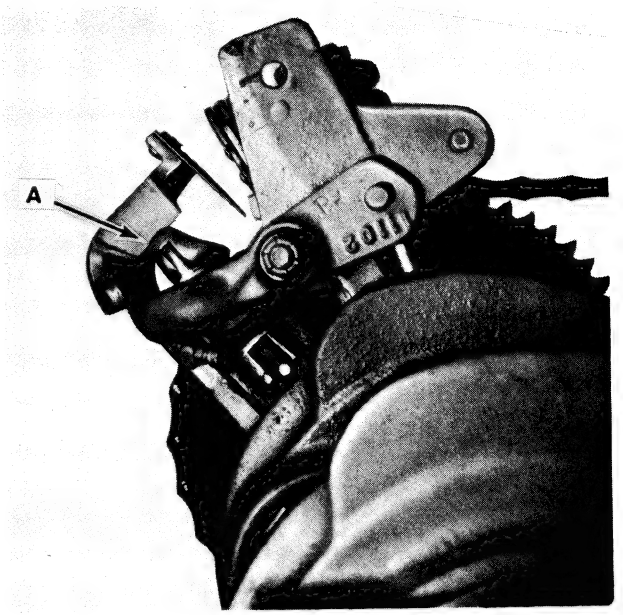


FIGURE 103

SHIELDS SHOWN REMOVED FOR CLARITY.

KNIFE ARM

The knife arm should be adjusted so the bill hook will revolve without contacting any surface of the knife arm assembly as shown in Figure 102.

The half-moon shaped knife arm stripper flange should rub against the heel of the hook when the knife arm operates as illustrated at A, Figure 103. When adjusted properly, the drag across the bill hook should be no more than 8-12 lbs. (36-53 N) when measured by pulling at the knife mounting surface. When set in this position, the flange will push the knot loop off the bill hook while the bill hook jaw holds the two ends and a good knot will be formed.

When the half-moon shaped stripper flange does not rub against the bill hook heel, it will pass by the twine and the loop will not be removed from the bill hook.

Knots may also hang on the bill hook if the knife arm has insufficient lift. When adjusted properly, the stripper flange of the knife arm will clear the end of the bill hook by not less than ⅜" (9 mm) and not more than ½" (13 mm) when the knife arm roller is on the high point of the cam on the cam gear.

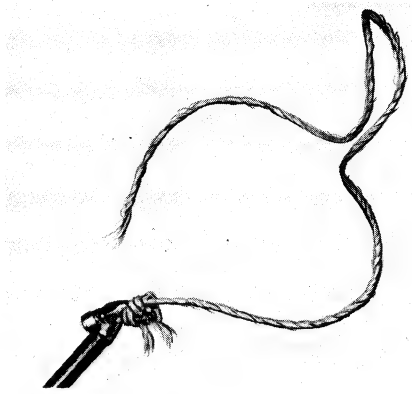
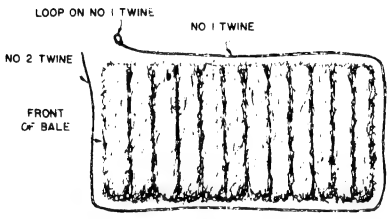
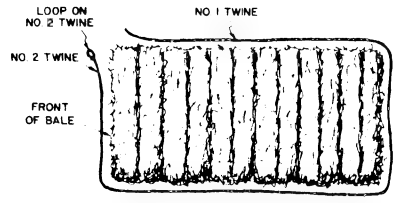
To determine when the knife arm adjustment is necessary, trip the knotter mechanism, turn the flywheel manually in the direction of rotation to run the knotter through one complete cycle. By watching the knife arm operate, see if any of the above mentioned knife maladjustments can be noted. If maladjustments are noticed, or if there is any reasonable doubt, remove the hairpin cotter and drilled rivet and swing the knotter assembly up from its regular position. By doing this, a closer inspection can be made of the knotter arm setting.

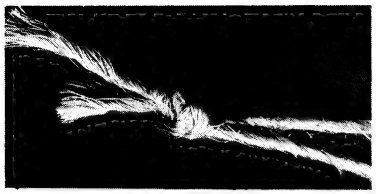
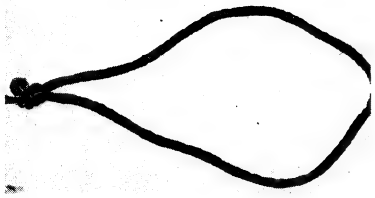
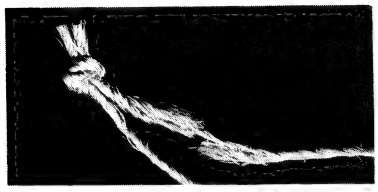
If it appears that a slight knife arm adjustment is necessary, it may be possible to bend the knife arm with a hammer or pry bar without removing any parts from the knotter.

Figure 92 shows the type of knot formed by a properly adjusted knotter.

KNOTTER SERVICE CHART

Some of the possible knotter difficulties and their corrective measures are summarized in detail in the next several pages.

PROBLEM	POSSIBLE CAUSE	CORRECTION
1. Knots hanging on bill hook. 	Too much tension on bill hook cam.	Loosen bill hook cam adjusting screw.
	Rough bill hook.	Smooth off all rough edges with fine file and emery cloth.
	Bill hook cam binding on bill hook adjusting screw.	File edges smooth in elongated hole in bill hook cam.
	Knife arm stripper does not contact back of bill hook.	Bend knife arm stripper so it touches bill hook lightly.
	Knife arm does not travel far enough.	Increase travel of knife arm by bending.
	Twine slipping out of twine holder during bale formation.	Increase tension on twine holder spring and/or decrease tension on tension rails.
2. No loop on end of twine delivered by the needles. 	Twine fingers too far back from needle slot. Too much clearance between twine fingers and needles.	Adjust twine fingers. Check the twine finger lever for possible bends or broken welds. Check the mounting bolts to make sure they are tight.
	Excessive clearance between top of plunger and bale chamber.	Adjust or replace plunger bearings.
	Hay dogs not entering bale chamber.	Clean hay and dirt from hay dog springs and replace if broken.
	Twine disc timing.	Advance or retard timing of disc so that both strands are caught in disc notch.
	Bill hook tongue fails to open wide enough.	Knotter bill hook roller has worn groove in knotter frame. Replace frame.
	Bent bill hook tongue.	Straighten tongue, or replace bill hook tongue.
	Badly worn twine finger cam. Baling resilient or springy material.	Replace. Install optional plunger face extensions.
3. No knot on the end of the twine held by the twine holder. 	Not enough tension on twine holder spring.	Increase tension on twine holder spring by tightening adjusting bolt about ¼ turn.
	Baling too tight.	Release bale tension accordingly.

PROBLEM	CORRECTION	POSSIBLE CAUSE
4. One end of twine longer than other or loop in one twine end.  	Dull twine knife. Insufficient tension on twine holder. Insufficient lift on knife arm. Bale weight too light.	Sharpen blade on knife arm. Tighten twine holder tension spring. Increase lift on knife arm. Increase weight by tightening bale tension screws.
5. Twine frayed or broken approximately ½" (13 mm) in back of knot. 	Insufficient clearance between back of bill hook and inside face of knife arm. Rough edge on knife arm.	Bend knife arm so bill hook will revolve freely. However, when the knife arm rises, the stripper arm must touch bill hook. Smooth roughness with emery paper or file.
6. Twine disc does not stay in time.	Twine disc pinion. Driv-Lock pin sheared. Shaft in twine disc turns in hub. Adjustable knotter worm slips on shaft.	Replace Driv-Lok pin. Replace twine disc assembly. Lock nut not tight enough. Tighten.

PLEASE READ CAREFULLY!

INCLUDED THROUGHOUT THIS MANUAL AND ON MACHINE DECALS YOU WILL FIND PRECAUTIONARY STATEMENTS SUCH AS "CAUTION", "WARNING" AND "DANGER", FOLLOWED BY SPECIFIC INSTRUCTIONS.

THESE PRECAUTIONS ARE INTENDED FOR THE PERSONAL SAFETY OF YOU AND THOSE WORKING WITH YOU. PLEASE TAKE THE TIME TO READ THEM.

PERSONAL SAFETY!

CAUTION: THE WORD "CAUTION" IS USED WHERE A SAFE BEHAVIORAL PRACTICE ACCORDING TO OPERATING AND MAINTENANCE INSTRUCTIONS AND COMMON SAFETY PRACTICES WILL PROTECT THE OPERATOR AND OTHERS FROM ACCIDENT INVOLVEMENT.

WARNING: THE WORD "WARNING" DENOTES A POTENTIAL OR HIDDEN HAZARD WHICH HAS A POTENTIAL FOR SERIOUS INJURY. IT IS USED TO WARN OPERATORS AND OTHERS TO EXERCISE EVERY APPROPRIATE MEANS TO AVOID A SURPRISE INVOLVEMENT WITH MACHINERY.

DANGER: THE WORD "DANGER" DENOTES A FORBIDDEN PRACTICE IN CONNECTION WITH A SERIOUS HAZARD.

ADDITIONAL PRECAUTIONARY STATEMENTS SUCH AS "ATTENTION" AND "IMPORTANT" ARE FOLLOWED BY SPECIFIC INSTRUCTIONS. THESE STATEMENTS ARE INTENDED FOR MACHINE SAFETY.

MACHINE SAFETY!

ATTENTION: THE WORD "ATTENTION" IS USED TO WARN THE OPERATOR OF POTENTIAL MACHINE DAMAGE IF A CERTAIN PROCEDURE IS NOT FOLLOWED.

IMPORTANT: THE WORD "IMPORTANT" IS USED TO INFORM THE READER OF SOMETHING HE NEEDS TO KNOW TO PREVENT MINOR MACHINE DAMAGE IF A CERTAIN PROCEDURE IS NOT FOLLOWED.

IMPORTANT!

FAILURE TO FOLLOW THE "CAUTION", "WARNING", AND "DANGER" INSTRUCTIONS MAY POSSIBLY RESULT IN SERIOUS BODILY INJURY.

TWISTER MAINTENANCE AND ADJUSTMENT

CAUTION!

DO NOT ATTEMPT TO MAKE TWISTER ADJUSTMENTS WHEN THE MACHINE IS RUNNING OR WHILE THE TRACTOR OR BALER ENGINE IS RUNNING.

IMPORTANT: The knotter/twister is driven by a double pawl clutch. Do not rotate the flywheel backward or damage to the knotter/twister will occur.

If it is necessary to turn the flywheel backward, disengage the knotter/twister clutch pawl and by pulling on the needle yoke, return the knotter/twister to its home position. Engage the pawl and stop before proceeding.

TWISTER STACK DISASSEMBLY

Should it become necessary to disassemble the twister for any reason, it should be reassembled to the dimensions shown in Figures 98, 99 or 113. To make reassembly faster and easier, it is advisable to keep track of the number of washers used between each part.

IMPORTANT: Be sure to check baler serial number when servicing the twister stack. Refer to the proper drawing for correct dimensions.

CAUTION! THIS SYMBOL IS USED THROUGHOUT THIS BOOK WHENEVER YOUR OWN PERSONAL SAFETY IS INVOLVED. TAKE TIME TO BE CAREFUL!

320 WIRE TIE S/N 420423 AND BELOW

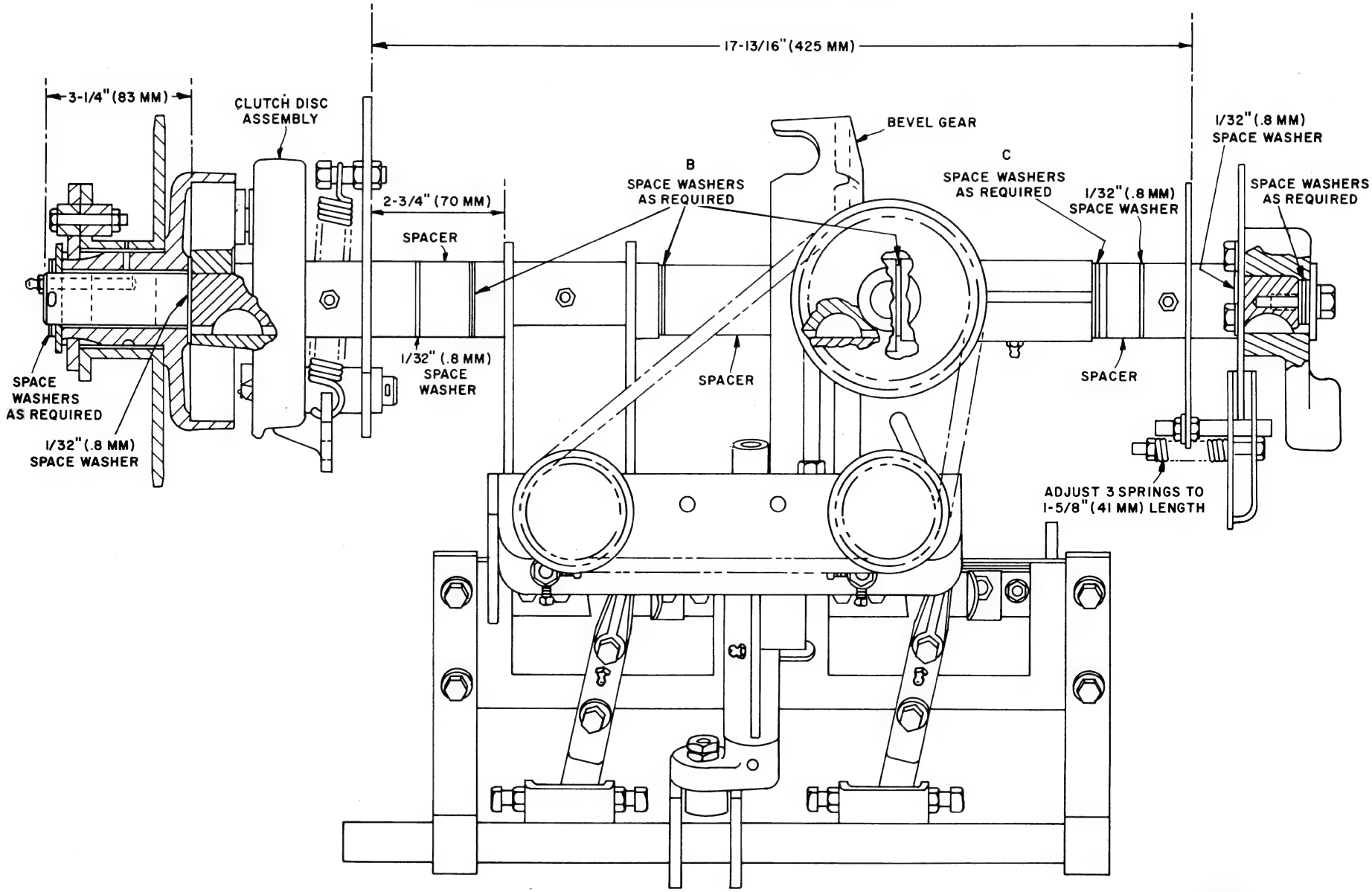


FIGURE 104

320 WIRE TIE S/N 420424 TO 462160

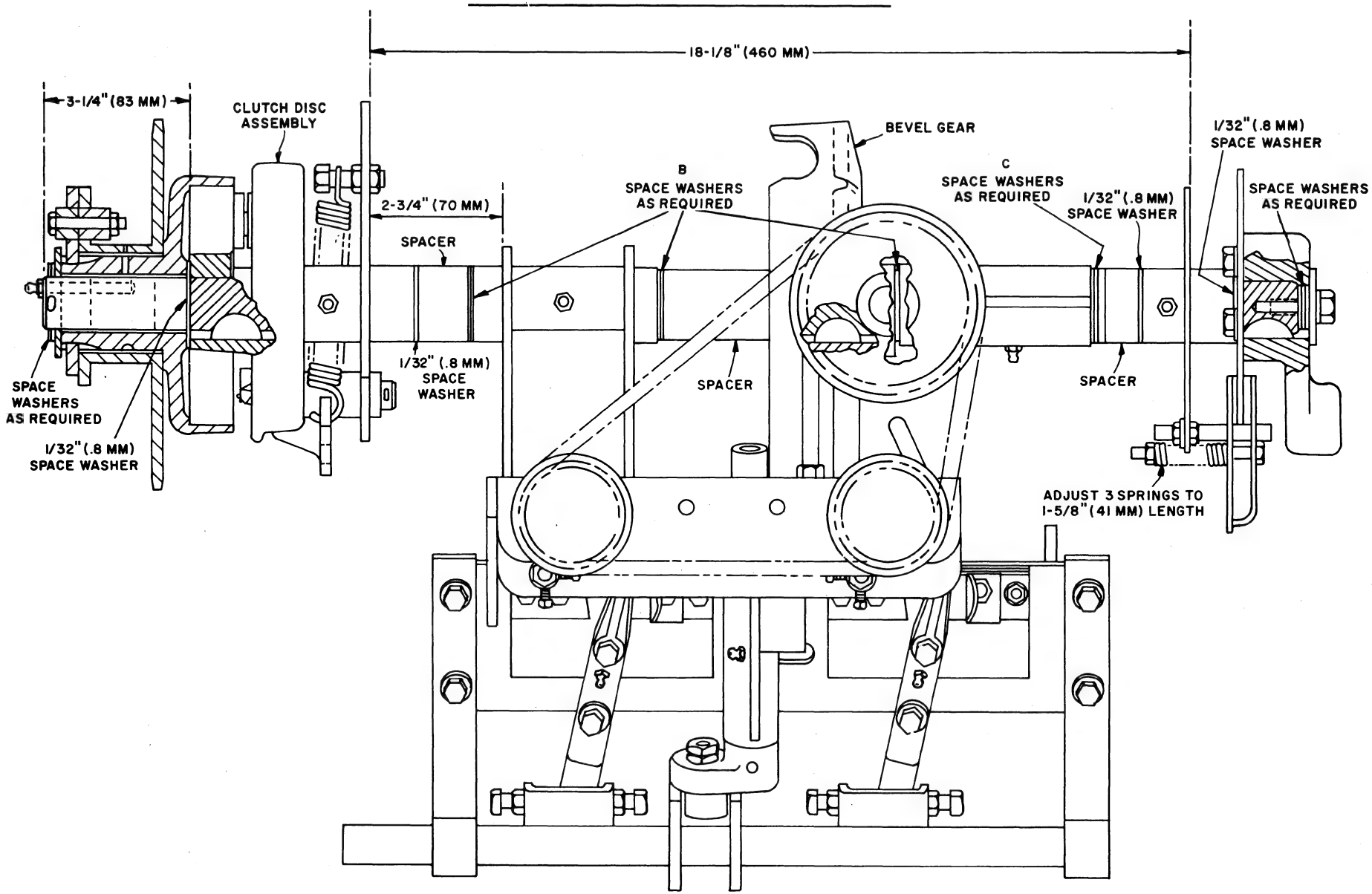
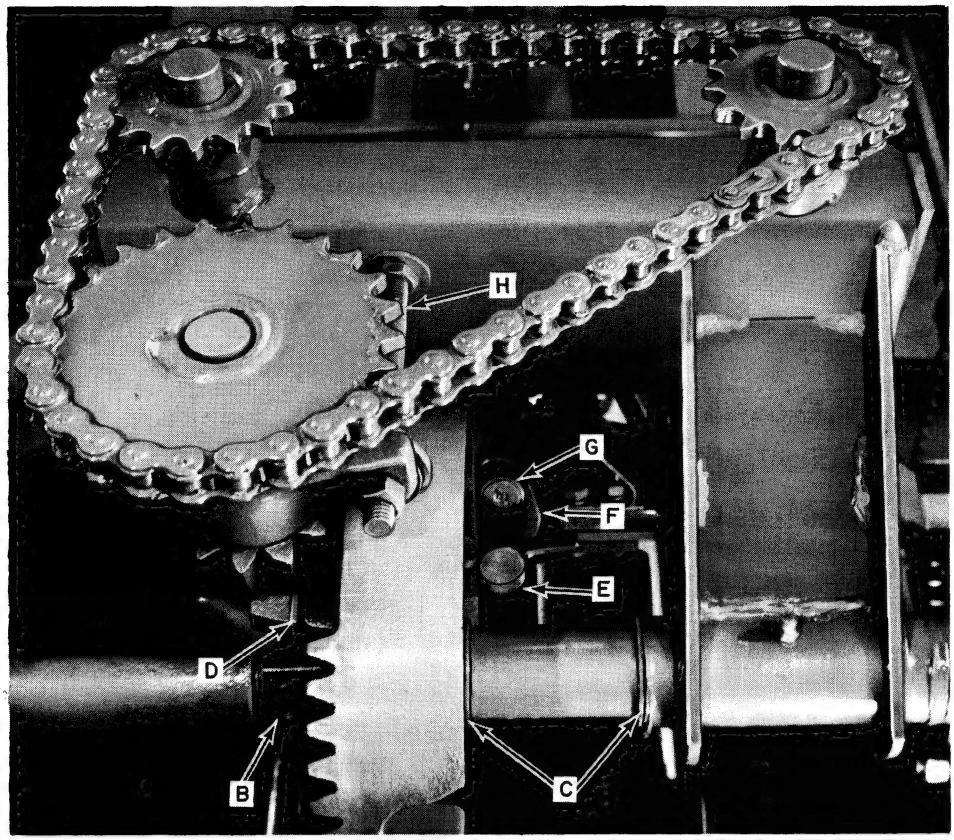


FIGURE 105



SHIELDS SHOWN OPEN FOR CLARITY. **FIGURE 106**

Disassembly can be accomplished by removing the parts from the left hand end of the stack in the following manner:

1. Remove the chain guard from the side of the baler and remove the twister drive chain.
2. Remove the cotter pin from the end of the twister shaft and remove the clutch assembly.
3. Loosen the clamping bolt in the clutch disc assembly. Remove the clutch disc assembly and woodruff key from the shaft.
4. Remove the left hand bearing assembly by removing the two ½" bolts which secure it to the bale chamber.
5. Slide the twine finger cam from the shaft and remove the woodruff key.
6. Remove bolt, H, Figure 106, and remove the twister hook drive chain.
7. Remove bolt, A, Figure 107, and slide the twister frame and spacer from the twister shaft.
8. Loosen the bevel gear clamp bolt and remove the bevel gear and woodruff key from the shaft.

NOTE: The bevel gear is held on the twister shaft with "Loctite" and may have to be heated.

9. Remove the pinion gear bracket and any other parts if further disassembly is required.

TWISTER STACK ASSEMBLY

To restack the twister assembly it is necessary to start at the right bearing assembly. Remember the number of washers originally used was noted in the disassembly process.

1. Install the same amount of washers as was originally used between the right bearing assembly and the bevel gear pinion bracket.
2. Install the bevel gear, the spacer and twister frame on the shaft with washers between each of these parts so the following requirements are met.
   a. The backlash between the flat portion of the bevel pinion and the flat portion of the bevel gear is from 0.002"-0.009" (0.05-0.23 mm) at D, Figure 106, when the opposite end of the pinion is touching the bevel gear.
   b. The clearance at G, Figure 106, between roller, F, and the bevel gear is no greater than 1/16" (1.6 mm) when roller, E, is touching.

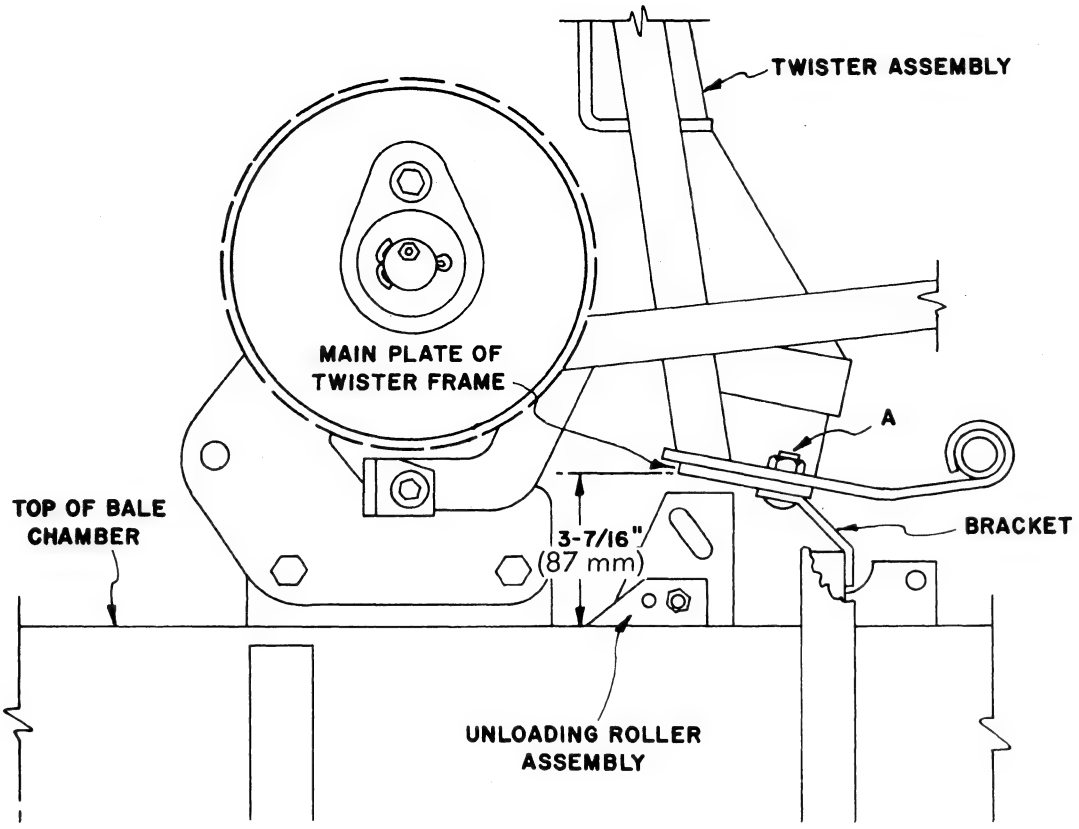


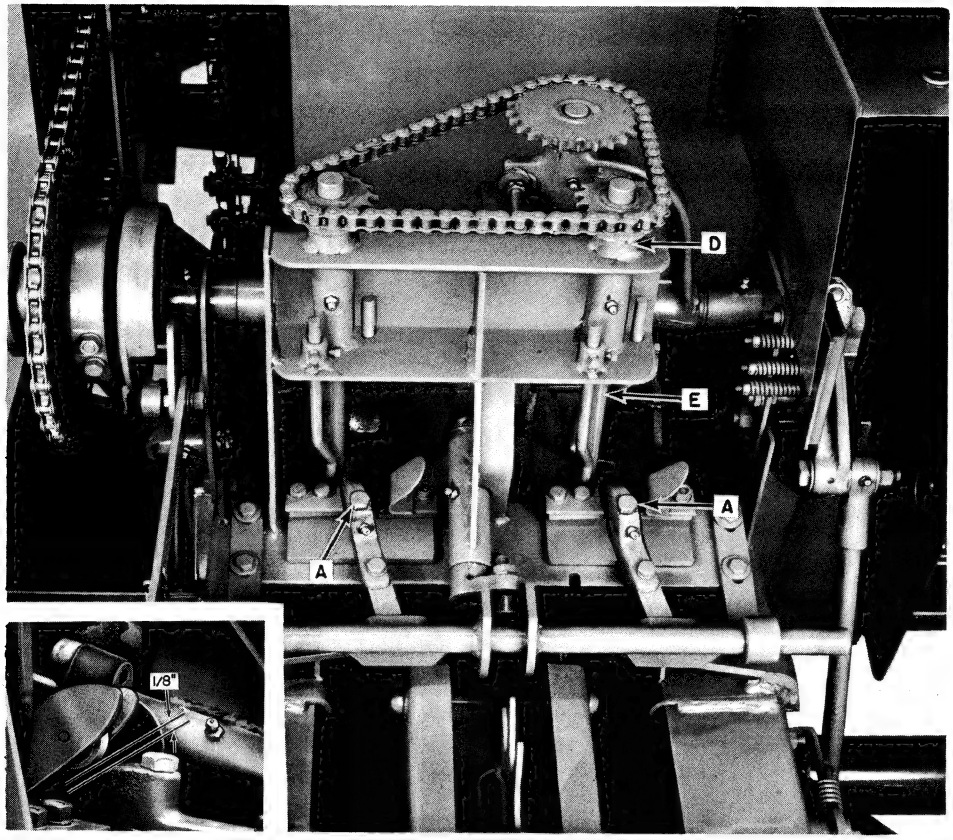
FIGURE 107

The three dimensions and clearances can only be obtained by trial and error and placing the correct number of spacer washers at B and C, Figures 104 and 105.

3. Install the woodruff key in the bevel gear and tighten the clamp bolt securely. Use "Loctite".
4. Slide the twister frame into position and install bolt, A, Figure 107. Adjust the twister frame up or down as required to obtain the 3-7/16" (87 mm) dimension shown in Figure 107.
5. Install the woodruff key and slide the twine finger cam and the left bearing assembly on the shaft with the required washers so the distance between the left and right bearing assemblies is as shown in Figures 104 and 105. Secure the left bearing support to the bale chamber with two ½" bolts.
6. Install the woodruff key and slide the clutch disc assembly in place and tighten the clamping bolt securely.
7. Replace the clutch assembly and install the cotter pin on the end of the twister shaft. Install the washer between the clutch disc as shown in Figures 104 and 105.
8. Replace the twister drive chain and retime the needles as outlined in section on "Needle Timing". Replace the chain guard.
9. Replace bolt, H, Figure 106, and install the twister hook drive chain. Tighten the chain as outlined and retime the twister hooks.
10. Replace the twister hook drive chain shield.
11. Now follow the "Procedure for Systematic Adjustment of the Twister Assembly".

TWISTER FRAME HEIGHT

The distance between the top of the chamber and lower edge of main plate on the twister frame should be 3-7/16" (87 mm). This adjustment can be obtained by bending the bracket shown in Figure 107 and raising or lowering the frame as required.



SHIELDS SHOWN OPEN FOR CLARITY.

FIGURE 108

NEEDLES

The needles should be adjusted horizontally so the center of the needle roller passes over the center of the clamp pivot bolts, A, Figure 108. Loosen bolts, C, and cap screw, D and E, Figure 109, slightly move the needle sideways to its proper location and tighten bolts.

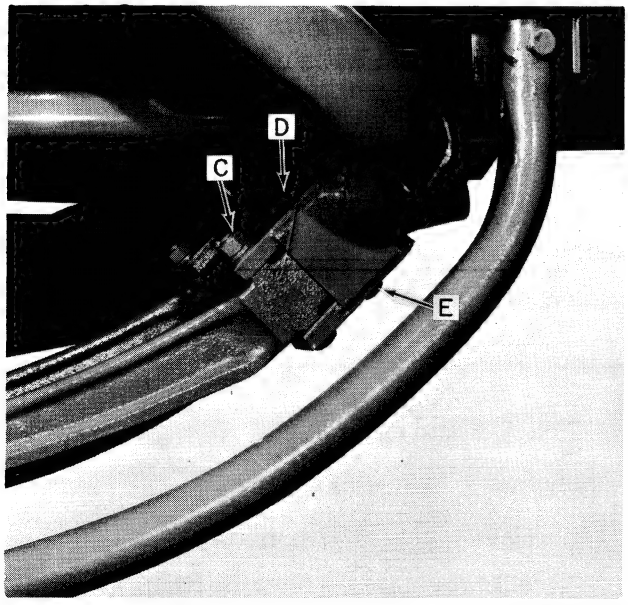


FIGURE 109

The needles should also be adjusted so the inner radius of the needle clears the wire shear clamp by 1/8" (3 mm) as shown in the inset in Figure 108.

Clearance between the needle and the wire shear clamp is INCREASED by LOOSENING cap screw, E, and TIGHTENING cap screw, D. This clearance is DECREASED by LOOSENING cap screw, D, and TIGHTENING cap screw, E, Figure 109.

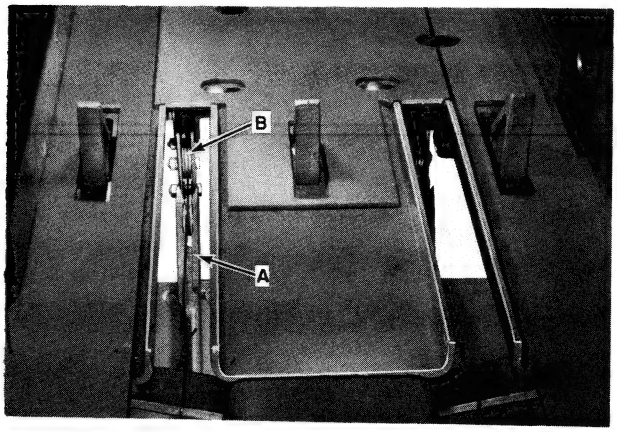


FIGURE 110

WIRE GUIDE AND ROLLER ASSEMBLIES

The roller in the wire guide, B, Figure 110, should align with the roller in the needle, A. This can be adjusted by moving the guide sideways as required.

The clearance between the tip of the needle and the end of the wire guide and roller assembly should be ½" (13 mm) as the needles enter the bale chamber as shown in Figure 111. This can be adjusted by loosening the mounting bolt and sliding the wire guide and roller assembly forward or backward as required.

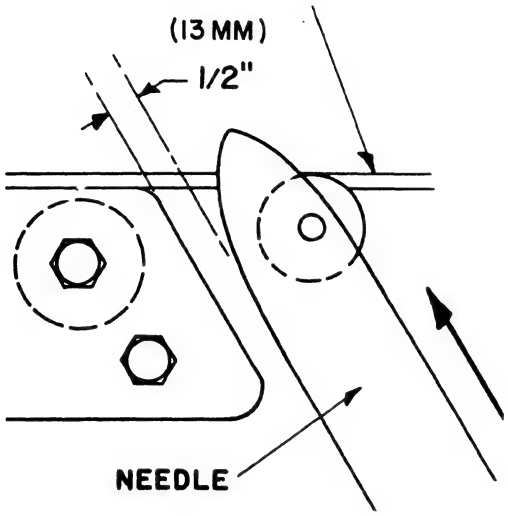


FIGURE 111

TWISTER HOOK HEIGHT

The twister hook should be adjusted so the bottom edge of the hook is 2¼" (57 mm) from the top of the bale chamber as shown in Figure 112.

This can be obtained by loosening the allen screws in the hub of the twister hook sprocket, D, Figure 108, and the set collar, E, Figure 108, moving the twister hook and shank up or down to the desired location.

NOTE: After setting the twister hook height it is very important to check to see that the twister hooks clear the needles through the entire cycle. If the twister hooks should strike the needles it may be corrected by raising the twister frame slightly higher than the 3-7/16" (87 mm) shown in Figure 107. If the frame is raised it will then be necessary to readjust the needles and twister hook height.

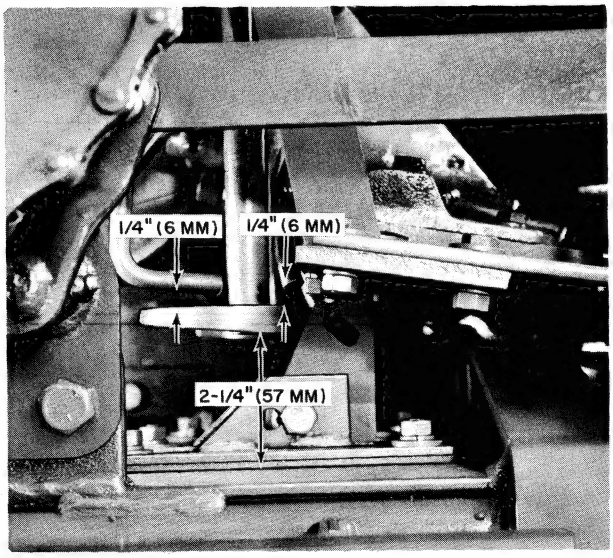


FIGURE 112

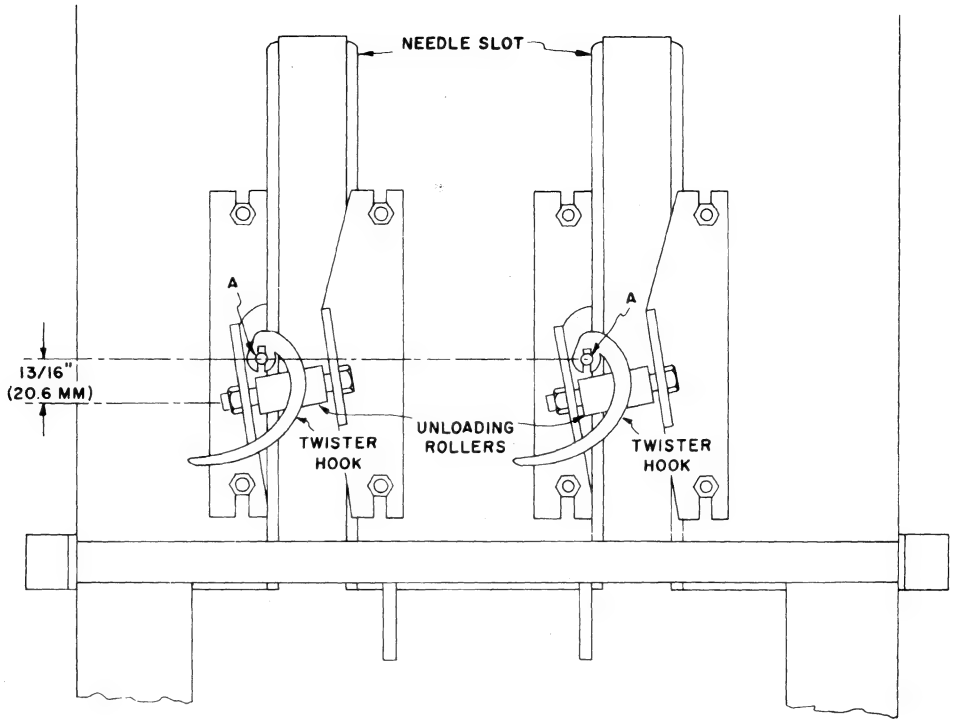


FIGURE 113

TWISTER HOOK TIMING

For the twister hooks to begin rotation at the proper time with respect to the movements of the other twister parts and the location of the wire, it is important that they be properly timed when in the home position.

When the hook is properly timed, the slot in the hook shown at A, Figure 113, is in line with the edge of the needle slot in the top of the bale chamber.

When it becomes necessary to retime the twister hooks, proceed in the following manner:

1. Be certain that the twister is in its home position. This is indicated when the knotter clutch pawl is tight against the knotter stop.
2. Loosen the allen screws at D, Figure 108.
3. Rotate the twister hook until it is in the proper position.
4. Check the distance between the twister hook and the top of the bale chamber and adjust if necessary.
5. Tighten the allen screws at D, Figure 108, securely.

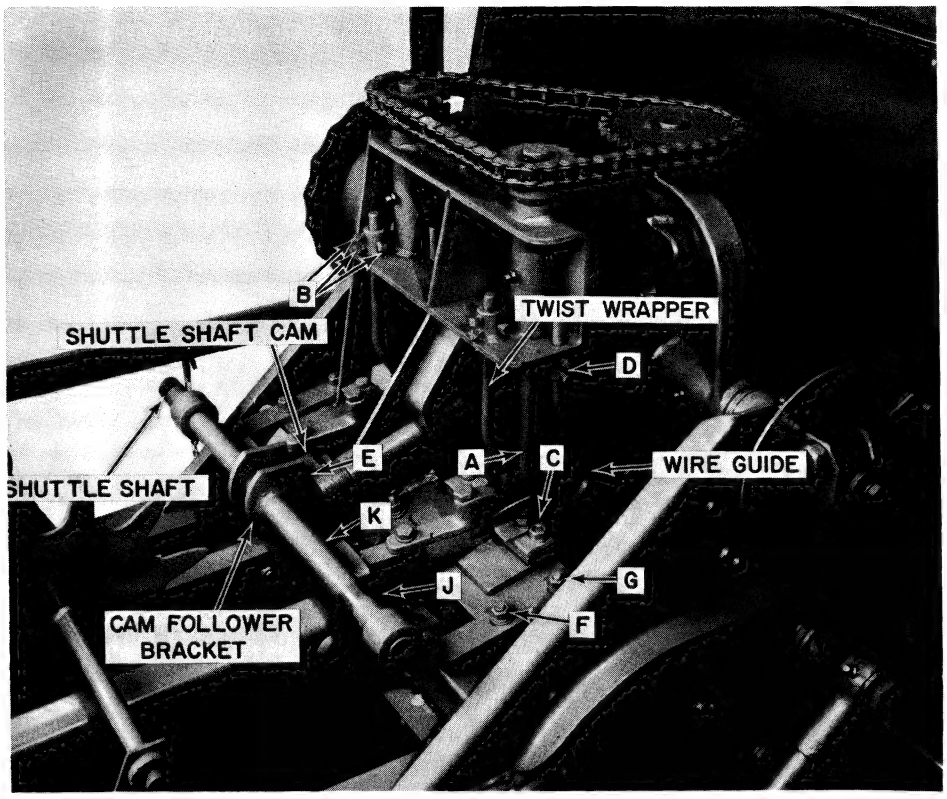


FIGURE 114

TWIST WRAPPER

The twist wrapper should be adjusted so it has 1/16" (1.6 mm) clearance from the twister hook shank as indicated at A, Figure 114, and centered behind it.

It should also be ajdusted so the end of the twist wrapper is ¼" (6 mm) away from the twister hook as shown in Figure 112.

This adjustment is obtained by loosening the set screws at B, Figure 114, and adjusting them to obtain the proper location of the twist wrapper.

After proper adjustment of the twist wrapper is obtained, tighten the adjusting screws securely.

WIRE GUIDE

The wire guide, shown in Figure 114, should be adjusted so it clears the twister hook shank by ⅛" (3 mm) at C, Figure 114, and the twister hook by ¼" (6 mm) as shown in Figure 112.

To obtain this adjustment, loosen set screws, D, Figure 114, and move the wire guide to the proper position, and retighten the screws.

CAM FOLLOWER CLEARANCE

The clearance between the cam follower bracket and the cam should be 1/32" (0.8 mm) at E, Figure 114.

To obtain this adjustment, loosen bolt, F and G, and the corresponding bolts on the opposite side. Move the shuttle shaft brackets to the proper location and retighten.

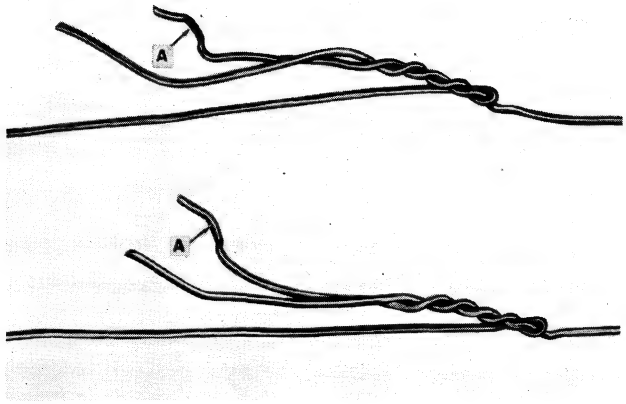


FIGURE 115

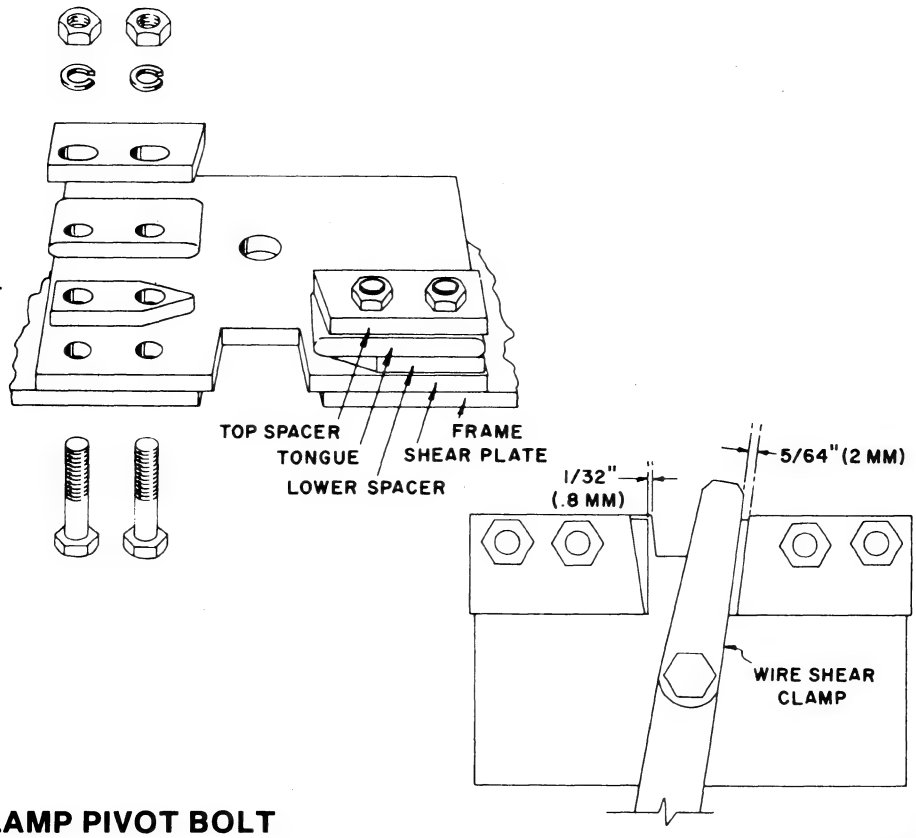


FIGURE 116

WIRE SHEAR CLAMP PIVOT BOLT

The shear clamp pivot bolt should not be tightened so the shear clamp cannot pivot freely. To properly adjust this pivot bolt, draw it up snug and then loosen it just enough to allow the shear clamp to pivot. Be sure to tighten the pivot bolt locking nut located on the under side of the main plate of the twister frame.

It is especially important to check to see that the shear clamp pivots freely after the baler has been idle for some time. Moisture and dirt accumulation will sometimes corrode these parts.

WIRE SHEAR CLAMP

The wire shear clamp must be adjusted so it holds the no. 1 wire securely while the bale is being formed, but does not crimp so severely as to break the wire.

The crimp at the end of the twist at A, Figure 115, is typical of a well adjusted wire shear clamp.

Obtain this adjustment with set screws, J and K, Figure 114. Adjust the clamping action with set screw, J, when the clamp is in the position shown in Figure 114, and with set screw, K, when the clamp is in the opposite direction.

The clamping action may be very easily checked by holding a piece of wire in the same position as the needle would place it in the twister and turning the machine through a twisting cycle.

If the clamping action is too severe, it will be indicated by the No. 1 wire falling away from the holder while the bale is being formed. When this occurs, a short piece of wire will be found held in the wire clamp. It may be corrected by loosening set screw, J or K, Figure 114, depending on which position of the clamp the action is too severe.

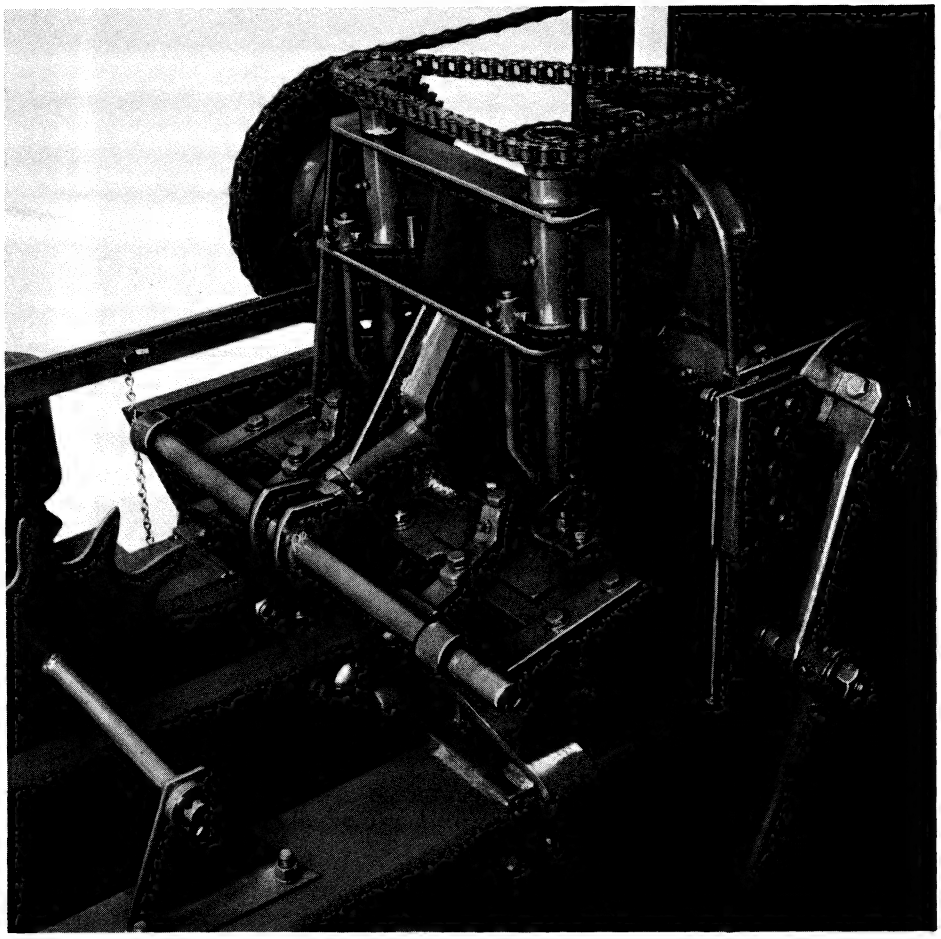
When the clamping action is insufficient, it will be recognized by the No. 1 wire pulling out of the holder while the bale is being formed. In this case there will not be a short piece of wire in the holder as is true when the clamp is too tight.

This problem may be corrected by tightening adjusting screws, J or K, Figure 114, as required.

UNLOADING ROLLERS

The unloading roller bracket should be located on the bale chamber so the horizontal distance between the twister hook shaft and the left end of the unloading roller bolts is 13/16" (21 mm) as shown in Figure 113. This adjustment is made by loosening the bolts which secure the unloading roller brackets forward or backward as required.

HEAVY-DUTY TWISTER MAINTENANCE AND ADJUSTMENT



SHIELDS SHOWN OPEN FOR CLARITY. **FIGURE 117**

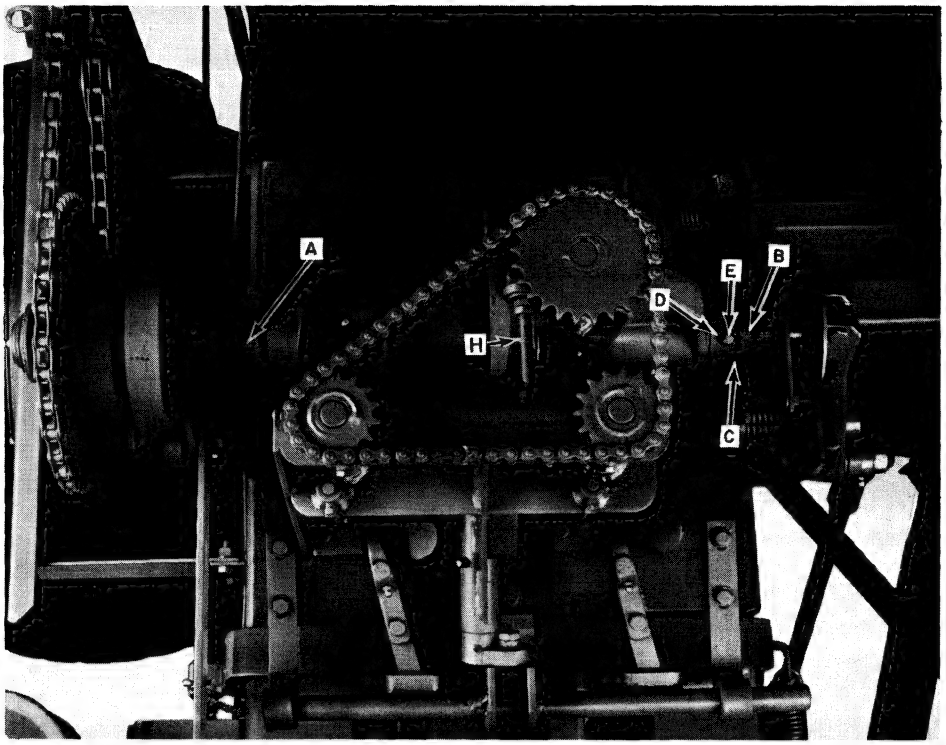
TWISTER HOOK DRIVE CHAIN

To prevent excessive wear and to prevent the possibility of the twister hooks jumping out of time, the twister hook drive chain should be kept reasonably tight at all times.

Maintain proper tension by adjusting nuts on bolt, H, Figure 118.

A heavy duty twister, pictured in Figures 117 and 118, is identical in operation and basically the same in adjustment as the standard twister. Two major differences are the diameter of the twister shaft, the heavy duty shaft being 1⅜" (35 mm) in diameter and the method of obtaining or controlling endplay in the twister stack. Two set collars, A and B, Figure 118, along with an eccentric, C, Figure 118, take up the endplay in the twister. The set screws in the set collars, A and B, Figure 118, are seated into the indentations in the twister shaft to assure that the set collars stay in position. To remove endplay in the twister stack, loosen jam nut, D, and set screw, E, Figure 118. Rotate cam, C, Figure 118, to remove endplay. Tighten set screw and jam nut.

IMPORTANT: When making any adjustments on the twister assembly, refer to the "Standard Twister Maintenance and Adjustment" section of this manual



SHIELDS SHOWN OPEN FOR CLARITY. **FIGURE 118**

If the twister stack has to be disassembled for repair, be sure to stack the assembly exactly as illustrated in Figure 119. The starting point in assembly is locating a set collar, A, Figure 118, and stacking to the left to the end of the shaft. After the bearing and clutch assemblies have been installed, then assemble the rest of the twister stack toward the right and install set collar, B, as shown in the drawing. Spacer washers installed between the set collar, B, and the right-hand bearing support are used to obtain the overall stack dimension.

The procedure for a systematic adjustment of the standard and heavy duty twister assemblies should be followed when reassembling and adjusting any of these twister stacks.

The twister service chart applies to both standard and heavy duty twisters.

CAUTION!

DO NOT ATTEMPT TO MAKE TWISTER ADJUSTMENTS WHEN THE MACHINE IS RUNNING OR WHILE BALER OR TRACTOR ENGINE IS RUNNING.

320 HEAVY DUTY TWISTER S/N 462161 AND ABOVE

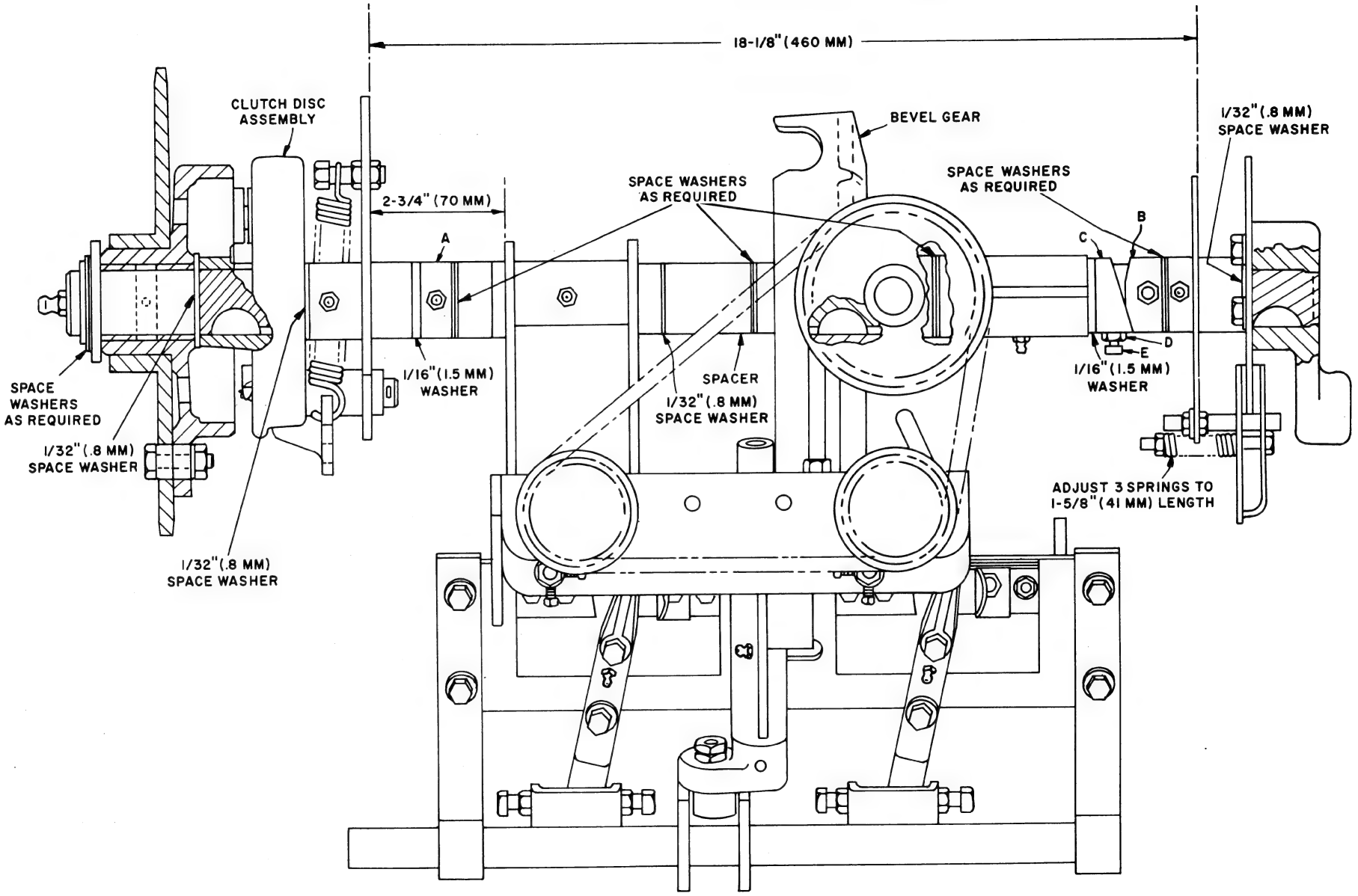


FIGURE 119

PROCEDURE FOR SYSTEMATIC ADJUSTMENT OF THE STANDARD AND HEAVY-DUTY TWISTER ASSEMBLIES

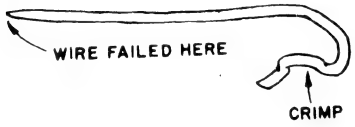
1. Inspect the twister drive shear bolt to be certain that the correct bolt is installed.
2. Rotate the twister assembly to make certain that the twister shaft is not bent or twisted.
3. **Twister frame height.** Adjust the twister frame height as shown in Figure 107.
4. **Needle penetration.** The needle yoke rod should be adjusted so when the needles are at maximum penetration the closest point on the needle yoke is ¼" (6 mm) from the bale chamber.
5. **Needle adjustment.**
   a. **Height.** The needle inner radius of the roller should clear the wire shear clamp by ⅛" (3 mm), inset Figure 108.
   b. **Centered on pivot bolt.** The center of the needle roller should be directly in line with the center of the wire shear clamp pivot bolt.
   c. **Needle rollers.** Make certain the rollers in the tips of the needles rotate freely.
6. **Needle drive timing.** Adjust as recommended.
7. **Wire guide and roller assemblies.**
   a. When standing at the rear of the machine looking forward, the rollers in the wire guide assembly (under bale chamber) should be in line with the rollers in the tips of the needles. See Figure 110.
   b. The clearance between the tip of the needle and the end of the wire guide and roller assembly should be ½" (13 mm), as shown in Figure 111.
   c. The wire guide and roller assemblies must be adjusted up or down so they carry the wire above the needle tips when needles are in home position.
   d. Inspect all rollers to be certain that they rotate freely.
8. **Twister hook.**
   a. **Height.** The twister hook should be adjusted so it is 2¼" (57 mm) from the top of the bale chamber.

      BE SURE THE TWISTER HOOK DOES NOT STRIKE THE NEEDLES.
   b. **Timing.** Adjust the twister hook timing as recommended.
   c. Remove any sharp edges from the twister hook which might damage the wire.
   d. If a groove is worn on the throat of the hook 1/32" (0.8 mm) or deeper, the hook should be replaced.
9. **Wire guide.** Adjust the wire guide as recommended — ¼" (6 mm) above top of hook. **NOTE: The tip of the wire guide should extend to the right beyond the edge of the twister hook. Bend slightly if necessary.**
10. **Twist wrapper.** Adjust the twist wrapper so the bottom end is ¼" (6 mm) from the top surface of the twister hook and centered behind the twister hook shank. It must also clear the twister hook shank by 1/16" (1.6 mm).
11. **Unloading rollers.** Make certain that unloading rollers rotate freely. Inspect the unloading rollers and make certain that they are not badly grooved.
12. **Location of the tongue.** The tongue should be located so the end of the tongue is 1/64" -1/32" (0.4-0.8 mm) away from the shear edge as shown in Figure 116. The wire clamp lower spacer, tongue and upper spacer should be located square with the front edge of the shear plate as shown in Figure 116.
13. **Cam roller clearance.** Adjust as recommended.
14. **Wire shear clamps.**
   a. Check the pivoting action of the shear clamp.
   b. Check severity of clamping action and adjust if necessary.
   c. Any rough edges should be removed from the clamp guard.
   d. Replace if grooves are worn into clamp.

TWISTER SERVICE CHART

PROBLEM	POSSIBLE CAUSE	CORRECTION
Three wires in twist.	Twister hook missed the No. 2 wire on the first revolution and didn't pick it up until after the shuttle bar had acted.	Check timing and adjustment of twister hook.
No. 1 wire not in twist.	Either pinched too tight by clamp thus breaking it off, or not held tight enough.	Check adjustment of wire shear and clamp.
No. 2 wire failed to get in twist.	Wire beside needle tip. Twister hook failed to catch No. 2 wire and pull it into clamp. Needle out of adjustment. No. 2 wire not properly placed in wire shear clamp.	Replace wire in guide and check adjustment of needle. Check timing and adjustment of twister hook. Adjust properly. Adjust needle. Adjust needle penetration. Adjust needle drive timing. Make certain hay dogs and hay stops are in good condition.
Twist broken at base. 	Baling too tight. Twist catching on way out of bale case. Twist hanging in twister hook radius. Improperly annealed wire.	Loosen bale tension. Release bale tension. Remove obstruction. Check timing of twister hook. Use properly annealed wire.
	Twister hook too close to bale case. Twist hanging in twister hook radius. Groove worn in throat of hook.	Move twister hook up to 2¼" (57 mm). Check timing of twister hooks. Replace hook.

CAUTION: THIS SYMBOL IS USED THROUGHOUT THIS BOOK WHENEVER YOUR OWN PERSONAL SAFETY IS INVOLVED. TAKE TIME TO BE CAREFUL!

PROBLEM	POSSIBLE CAUSE	CORRECTION
Twist unwinding.	Inproper wire gauge or hardness. Baling too tight. Twister hook too far from bale chamber.	Use 14½ gauge annealed wire. Release tension. Lower twister hook.
Wire pulls apart between bales.	Rough or rusty wire. Hay wedges in place while baling tough material. Wire off rollers on bottom of bale chamber.	Oil wire in containers with used motor oil. Remove rear set of hay wedges. Replace wire and set guides closer to rollers.
No twist formed. Short pieces of wire on top of bale case. 	Twister hook picks up No. 3 wire on last revolution. When the No. 3 wire becomes the No. 1 for the next bale, the No. 1 is inside the hook rather than outside and is broken off as the hook begins to turn to form a twist.	Needle-to-plunger timing is late. Advance needle timing as much as possible.

ATTACHMENTS

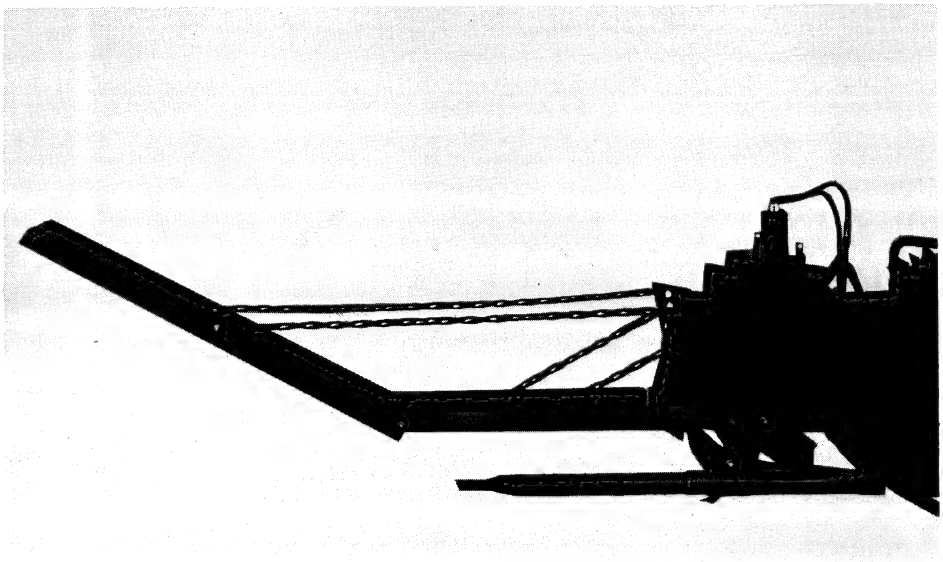


FIGURE 120

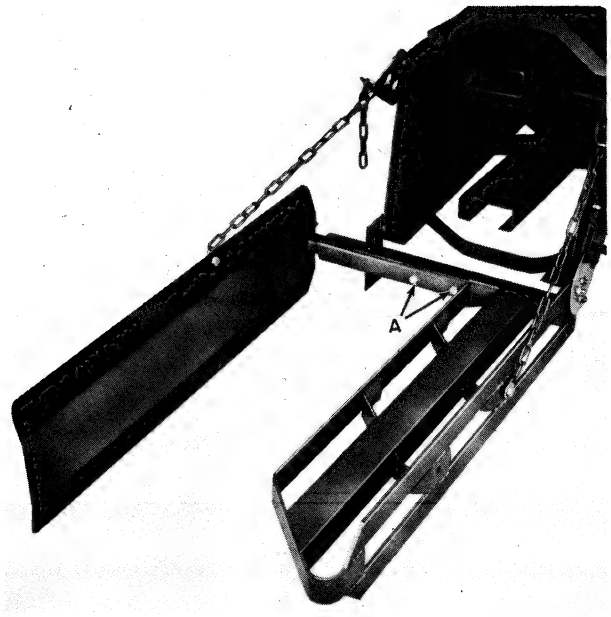


FIGURE 121

WAGON HITCH AND LOADING CHUTE (Figure 120)

The loading chute slides the bales up a chute to a wagon. The telescoping wagon hitch attaches directly to the bale chamber.

REVERSIBLE QUARTER TURN BALE CHUTE (Figure 121)

The quarter turn bale chute can be installed to turn bales to either the left or right.

The bale deflector can be adjusted to the left or to the right to make the bales stand on their side by moving bolts, A, Figure 121.

A disc type brake helps to eliminate bale chute bounce so the bales are aligned for pick-up with a bale wagon. The brake will also hold the bale chute in the transport position, eliminating the need to adjust the chain.

Adjust the spring length to 1¼" (32 mm). It may be necessary to increase or decrease the spring length depending on the ground conditions.

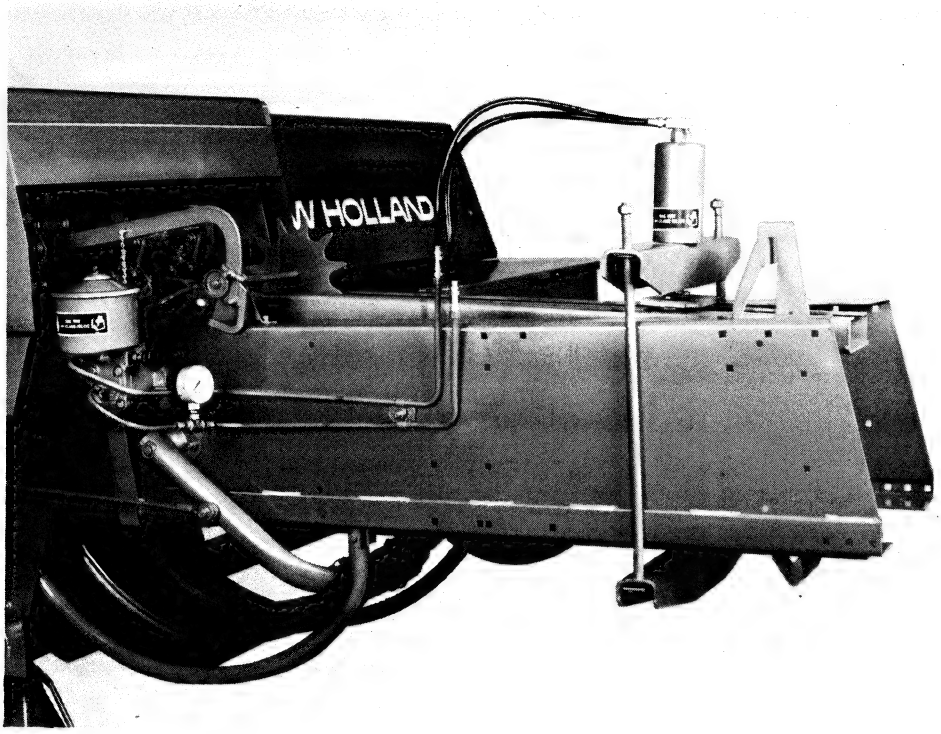


FIGURE 122

HYDRAFORMATIC BALE TENSION CONTROL (Figure 122)

The hydraformatic bale tension control insures uniform bale weight under all conditions.

Fill the pump reservoir with Type MS, 10W 40 weight motor oil. Operate the machine slowly for a few minutes until pressure begins to build up in the system.

CARE MUST BE TAKEN TO KEEP THE OIL CLEAN AND FREE OF DUST, WATER SEALING COMPOUNDS, etc. DO NOT USE HYDRAULIC BRAKE FLUID.

When starting to bale, return the control valve counter-clockwise as far as possible to remove all pressure from the tension rails of the bale chamber. Operate the baler until the bale chamber is full of hay.

With the bale chamber full of hay, turn the control valve clockwise until the gauge registers approximately 100 lbs. (690 kPa) of pressure, and continue to bale.

After producing several bales, check the weight and density of the bales and readjust the control valve on the pump accordingly. As a rule, when only a slight variation in bale weight is desired, ¼ to ½ turn of the control valve is sufficient. If a bale of the desired density cannot be produced by regulating the pressure on the hydraulic system, loosen or tighten the nuts on the tension bolts several turns.

It is not possible to state the definite pressure gauge reading required to produce a given weight bale, because of the variation in different types of material and the differences in the moisture content of the same crop at different seasons. Experience will teach the operator the correct pressure requirement for particular conditions.

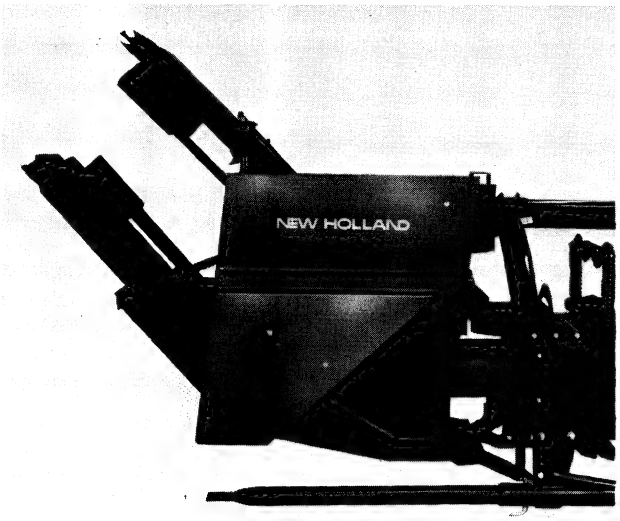


FIGURE 123

BALE THROWERS (Figures 123-124)

The Model 70 bale thrower lets you bale and load at the same time. Continuous rubber throwing belts provide powerful throwing action and can handle bales up to 36" (90 cm) long and 80 lbs. (36 kg) in weight. Available with either electrical or mechanical variable speed controls. Designed to track the wagon automatically on turns. For PTO twine tie balers only.

The Model 75 bale thrower allows baling and loading in the same operation. It will throw bales from 27" (69 cm) to 41" (104 cm) long. Available with electric or manual-hydraulic controls. For twine or wire tie PTO Model 320 above serial number 571460.

NEEDLE SLOT BAFFLES (Figure 125)

For use when stemmy materials interfere with tying the knot. This attachment closes a portion of the needle slot in top of bale chamber to prevent stems from interfering with twine or wire.

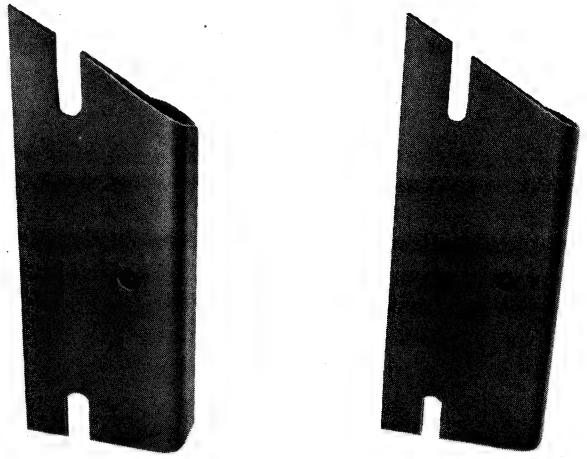


FIGURE 125

FIGURE 124

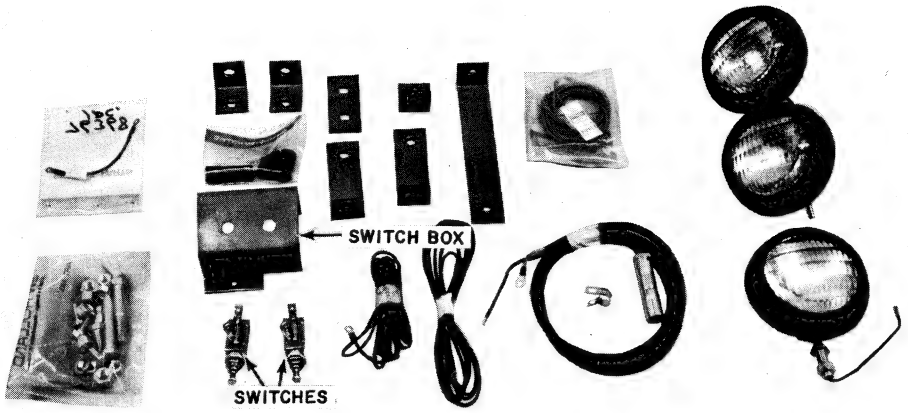


FIGURE 126

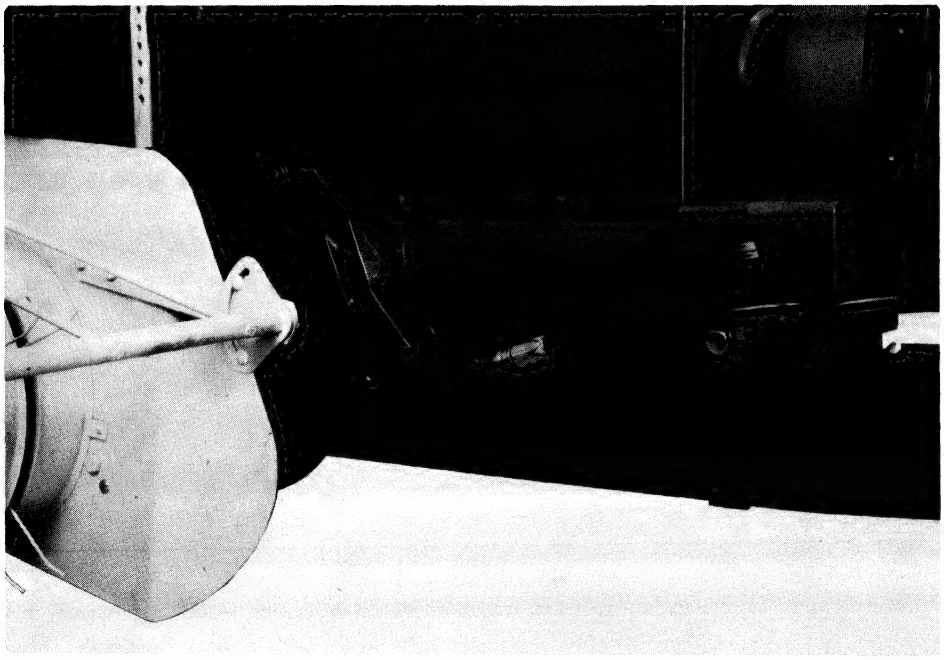


FIGURE 127

LIGHT KIT (Figure 126)

A light kit is available to supply light for night baling if required. It also provides warning lights for highway travel.

PICK-UP LIFT (Figure 127)

A kit is available to raise and lower the pick-up assembly hydraulically using tractor cylinder. It is especially helpful where conditions require raising the pick-up frequently.

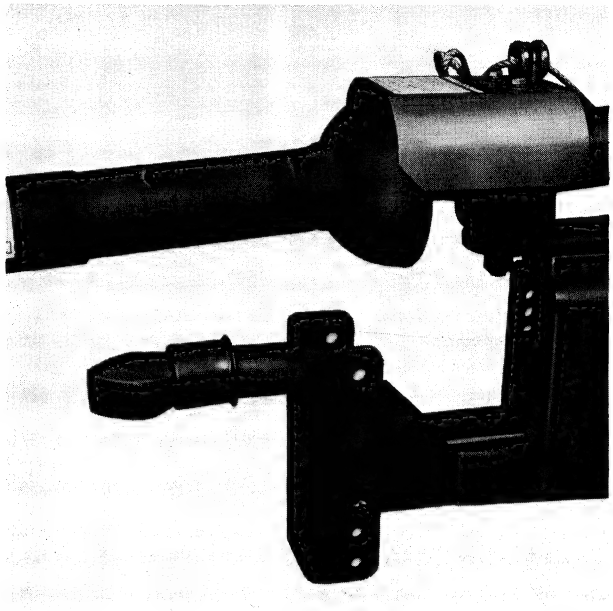


FIGURE 128

BALL HITCH (Figure 128)

Optional ball hitch available for easier hook-up to tractor.

PLEASE READ CAREFULLY!

INCLUDED THROUGHOUT THIS MANUAL AND ON MACHINE DECALS YOU WILL FIND PRECAUTIONARY STATEMENTS SUCH AS "ATTENTION", "CAUTION", "WARNING" AND "DANGER", FOLLOWED BY SPECIFIC INSTRUCTIONS.

THESE PRECAUTIONS ARE INTENDED FOR THE PERSONAL SAFETY OF YOU AND THOSE WORKING WITH YOU. PLEASE TAKE THE TIME TO READ THEM.

ATTENTION: THE WORD "ATTENTION" IS USED TO WARN THE OPERATOR OF POTENTIAL MACHINE DAMAGE IF A CERTAIN PROCEDURE IS NOT FOLLOWED.

CAUTION: THE WORD "CAUTION" IS USED WHERE A SAFE BEHAVIORAL PRACTICE ACCORDING TO OPERATING AND MAINTENANCE INSTRUCTIONS AND COMMON SAFETY PRACTICES WILL PROTECT THE OPERATOR AND OTHERS FROM ACCIDENT INVOLVEMENT.

WARNING: THE WORD "WARNING" DENOTES A POTENTIAL OR HIDDEN HAZARD WHICH HAS POTENTIAL FOR SERIOUS INJURY. IT IS USED TO WARN OPERATORS AND OTHERS TO EXERCISE EVERY APPROPRIATE MEANS TO AVOID A SURPRISE INVOLVEMENT WITH MACHINERY.

DANGER: THE WORD "DANGER" DENOTES A FORBIDDEN PRACTICE IN CONNECTION WITH A SERIOUS HAZARD.

STORING THE BALER

1. At the close of the baling season remove the material from the bale chamber and coat the bale chamber and the knotters lightly with grease to prevent rusting.
2. Remove the roller chains from the machine and clean thoroughly by soaking them in kerosene. Coat with heavy oil before storing. Reclean the chains and apply a light coating of oil before using again.
3. Remove the V-belts, wipe clean, and store in a cool dry place for best belt life.
4. To increase the life of the tires, place the baler on blocks to remove the load from the wheels when the machine is stored.
5. Completely clean and thoroughly lubricate the entire machine.
6. Provide adequate protection from the weather.
7. It is good practice to have the baler inspected at the end of each season and the complete machine put in top condition. At this time worn chains, sprockets, bearings, etc., should be replaced and other necessary adjustments made.

NOTE: Your authorized Sperry New Holland dealer will be glad to inspect and service your machine for you. A periodic check-up in his shop will help you to keep your maintenance at a minimum.

ORDERING SERVICE PARTS

When preparing the baler for storage, check the baler thoroughly for any parts that may have become worn or need replacing. USE THE CHECK LIST TO ASSIST IN MAKING A LIST OF THE PARTS NEEDED AT THIS TIME.

Service parts should be ordered at once and installed before the next baling season.

When ordering service parts, always be sure to give your Sperry New Holland dealer the model and serial number of your baler, as well as the quantity, part number, and an accurate description of each part.

The plate containing the model and serial number of the baler is located on the front end of the baler frame beside the flywheel.

INSIST ON GENUINE SPERRY NEW HOLLAND SERVICE PARTS. FOR BEST PERFORMANCE HAVE YOUR BALER SERVICED BY AN AUTHORIZED SPERRY NEW HOLLAND DEALER.

CHECK LIST FOR ORDERING SERVICE PARTS

1. Check the slicing knives.
2. Examine all belts, chains, and sprockets for wear.
3. Inspect the hitch bracket for excessive wear.
4. Check all bearings for wear.
5. Inspect the plunger and the connecting rod.
6. Examine the complete knotter assembly and check for excessive wear at any point; especially note the rollers on the assembly, bill hooks, bill hook cams, etc.
7. Replace any broken or bent pick-up fingers.
8. Make sure the cam rollers of the pick-up assembly are in good condition.
9. Inspect complete feeder assembly.

NOTE A — An extra set of slicing knives is a good investment. Dull knives can then be sharpened while the spare set is being used.

NOTE B — Replace worn sprockets when installing new roller chains.

SPECIFICATIONS

GENERAL

Overall width	113" (287 cm)
Overall length —	
Bale chute up	18'11½" (578 cm)
Bale chute down	20'9½" (634 cm)
Weight — PTO —	
Twine	3510 lbs. (1592 kg)
Wire	3545 lbs. (1608 kg)
Wheel tread	103-13/16" (264 cm)
Wheel bearings	Tapered roller
Maximum road speed	20 mph (32 km/hr)

PTO

Type	Dual telescoping 3 joint — ASAE std.
Protection	Friction clutch plus overrunning clutch

TIRES

	Flotation
Right	27 x 9.50 x 15, 4 ply — 24# press (165 kPa)
Left	31 x 13.50 x 15, 6 ply — 30# press (207 kPa)
Pick-up	3.00 x 12 — semi-pneumatic

PICK-UP

Width (including flare)	74¼" (189 cm)
Number of tooth bars	6
Number of teeth	132
Tooth spacing	2⅝" (67 mm)

PLUNGER

Speed	Up to 105 strokes per minute maximum
Stroke	30" (762 mm)
Roller	9 sealed ball bearings

MAIN DRIVE

Flywheel diameter	22" (559 mm)
Protection	Shear bolt
Gear box bearings	Tapered roller

KNOTTER

Protection	Shear bolt
Twine	Natural fiber or plastic

TWISTER

Protection	Shear bolt
Wire	Annealed 14½ Gauge

CAUTION!

MOST FARM IMPLEMENT ACCIDENTS CAN BE AVOIDED BY THE OBSERVANCE OF A FEW SAFETY PRECAUTIONS.

1. **DON'T CLEAN, LUBRICATE, OR MAKE ANY ADJUSTMENTS ON THE BALER WHILE IT IS IN MOTION.**
2. **DON'T ENGAGE THE CLUTCH UNTIL YOU KNOW THAT EVERYONE IS CLEAR OF THE MACHINE AND HAVE MADE SURE THAT NO TOOLS ARE LYING ON THE MACHINE.**
3. **DON'T WORK AROUND THE MACHINERY IN LOOSE CLOTHING THAT MIGHT CATCH IN ANY OF THE MOVING PARTS.**
4. **DON'T ATTEMPT TO PULL LOOSE HAY FROM ANY PART OF THE BALER WHILE IT IS IN OPERATION.**

INDEX

DELIVERY REPORT

MODEL 320 HAYLINER

OWNER COPY

Dealer Name _____

Street, RR, Box _____

City _____ State _____ Zip _____

Baler Serial No. _____

Owner's Name _____

Street, RR, Box _____

City _____ Zip _____

Baler Serial Number _____

Using the operator's manual as a guide, instruction was given as indicated by the checkmarks.

( ) 1. Safety precautions
( ) 2. Attaching tractor to baler
( ) 3. PTO adjustments
( ) 4. Controls
( ) 5. Threading baler
( ) 6. Baler operation
( ) 7. Lubrication points
( ) 8. Lubrication intervals
( ) 9. Oil levels
( ) 10. Proper lubricants
( ) 11. Two shear bolt locations
( ) 12. Bale weight adjustment
( ) 13. Bale shape adjustments
( ) 14. Drive chain adjustments
    ( ) a. Main drive chain
    ( ) b. Pick-up drive chain
    ( ) c. Knotter/twister drive chain
    ( ) d. Tine bar drive chain
    ( ) e. Pick-up driven chain
    ( ) f. Hydraformatic pump drive chain (if so equipped)
( ) 15. Sharpening knives
( ) 16. Knife and plunger bearing adjustment
( ) 17. Bale counter adjustment
( ) 18. Safety shielding maintenance
( ) 19. Sperry New Holland Warranty
( ) 20. Review safety procedures

Delivery person's signature _____ Date _____

I have been instructed in the operation, maintenance and safety features of this machine as detailed in the operator's manual, given to me when the machine was delivered.

Owner's Signature _____ Date _____

DELIVERY REPORT

MODEL 320 HAYLINER

DEALER COPY

Dealer Name _____

Street, RR, Box _____

City _____ State _____

Baler Serial No. _____

Owner's Name _____

Street, RR, Box _____

City _____ Zip _____

Baler Serial Number _____

Using the operator's manual as a guide, instruction was given as indicated by the checkmarks.

( ) 1. Safety precautions
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NEW HOLLAND

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